290.8
C765

LIBRARY
RECEIVED
OCT 17 1939
U.S. Department of Agriculture

Contractors and Engineers Monthly

Vol. 36, No. 10 OCTOBER, 1939 $2 a Year, 20 Cents a Copy

OCT 18 1939

Highlights Of This Issue

- **The Giant of Them All**
  The Central Valley Project in California, including the construction of Shasta and Friant Dams, the former to be the second largest concrete structure in the world, involves in addition a vast amount of excavation for railroad and highway relocation before work can begin on Shasta Dam, and the construction of miles of canals as well as the two dams. An outline of the project appears in this issue.
  See page 2.
- **Where Many Feet Have Trod**
  The story of the maintenance of the roadways and walks at the New York World's Fair, which was done by contract, is told in this issue.
  See page 2.
- **Spandrel Arch Bridge**
  One of the interesting features of the construction of a 579-foot spandrel arch bridge over Onion Creek, southeast of Austin, Texas, was the self-supporting trusses for the forms for the arched ribs.
  See page 7.
- **D.B.S.T. Methods in Georgia**
  In spite of the fact that D.B.S.T. always sounds faintly suggestive of profanity to us, it has become increasingly widely used in many sections to provide a low-cost wearing surface on substantial bases. One such project in Georgia is described in this issue.
  See page 11.
- **County Problems in Minnesota**
  County-aid roads, highway financing, organization, equipment, construction and maintenance were discussed by the County Engineer of Faribault County, Minn., when interviewed by our Editor this summer.
  See page 23.
- **That Rural Mail Box Problem**
  State and county highway maintenance engineers have long been confronted with the problem of shoulder maintenance in rural areas where R.F.D. mail boxes appear along the roadside. Texas has, we feel, solved this problem rather neatly.
  See page 26.

IN THIS ISSUE

Airport Construction	34
Bituminous Roads	11, 14
Blasting in Winter	20
Bridge Construction	7
Concrete Roads	1
County Road Work	1, 23
Dam Construction	2
Editorial	4
Ice Control	1
Levee Construction	8
Picks and Shovels	22
Road Drainage	17
Road Maintenance	2, 24, 26
Roadside Development Awards	1
Safety	14
Tunnel Construction	28

A Genesee County Winter Maintenance Truck with Snow Plow, Sand Spreader And Rear Spotlight for Night Work

Ice Treatment On County Roads

In Genesee County, Mich., Ice Problem Exceeds That Of Snow Removal; Ways and Means of Solving It

By JOHN H. DENNIS, County Engineer, Genesee County, Mich., Road Commission

✦ THERE is little question that the present demands of traffic are for roads free from ice hazards. A great number of accidents, so many of which are fatal, together with a large amount of property damage, have brought this forcibly to the attention of the traveling public. In addition, the time limit from raw product to the consumer has been decreased at a very marked rate and it is of vital importance that truck delivery schedules, both for food supply and for

(Continued on page 32)

New Type of Joints For Concrete Paving In Massachusetts

Central Construction Co. Used Poured Rubber Joints On Job Between North Adams and Williamstown

✦ THE first pouring of Jointlok rubber expansion joints in Massachusetts was made on July 14, 1939, on a 2.75-mile concrete pavement laid in two 12-foot strips of 8-inch uniform thickness. This Central Construction Co. contract ran west from North Adams toward Williamstown. Of added interest is the use of both portland and natural cement for the concrete in the ratio of one bag of natural for six bags of portland cement, in an endeavor to reduce surface checking and damage to the surface of the pavement by the calcium chloride used in winter as part of the ice-control program.

Poured Rubber Joints

The expansion-joint material at the bottom of the joints on this contract is Johns-Manville ¾-inch premoulded cork expansion joint material set in the usual manner with an unequal-leg steel plate to insure a straight joint. The cork material comes only to within 2 inches of the top of the pavement, leaving the balance to be filled by the poured joints. Because of the space taken by the unequal-leg plate there was considerable space on both sides of the premoulded cork material. To form a bulkhead which would prevent a needless waste of rubber in the base of the joint section, these spaces were plugged with standard oakum.

Following this, the ends of the concrete pavement at the joints were thoroughly primed, using small spiral brushes which fitted closely within the joint openings. After this material had cured for some 5 to 10 minutes, the previously prepared rubber joint material was poured, using an ordinary watering can with the nose slightly bent to fit the joint openings.

The rubber latex and the Fillcure powder were mixed with a wooden paddle in a large galvanized iron can, using 2 gallons of the latex and one 4-pound package of the powder. As soon as this was thoroughly mixed it was poured into the hand pot and the joints filled. The material forms a brown waterproof skin upon the surface within a few minutes after exposure to the air, and within several hours the entire joint becomes reasonably solid. During this time the joint was protected from dust and gravel by laying a board across the pavement.

Fine Grade and Form Setting

Following the spreading of the 12-inch gravel cushion and subgrade it was compacted by a 3-wheel 10-ton Hercules roller. Then seven men with a foreman prepared the lines for the forms and set the steel Metaforms for the concrete. Back of this an Austin-Western 77 Senior removed excess material and

(Concluded on page 9)

C. & E. M. Photo
John E. Higgins Takes a Hand at Pouring the New Rubber Joint

Nominations Go to Judges November 1 For Roadside Development Awards

✦ ON the first of this month the nominations for the 1939 Roadside Development Awards were closed and will soon be in the hands of the Sectional Judges. These Awards will go to the contractors making the greatest contributions to roadside development in their 1939 contracts and consist of four Sectional Awards, one for each of the four sections of the country, and one National Award.

We are privileged to announce that the four Sectional Judges are Murray D. Van Wagoner, Michigan State Highway Commissioner; Lacey V. Murrow, Director of Highways for the State of Washington; Henry G. Shirley, Virginia State Highway Commissioner; and G. H. Delano, former Chief Engineer of the Massachusetts Department of Public Works; each judging a section other than his own.

When the four Sectional Award winners have been selected, their nominations will be turned over to the judges for the National Award. These judges are H. H. Bennett, Chief, Soil Conservation Service, U. S. Department of Agriculture; Roy W. Crum, Director, Highway Research Board, National Research Council; and Charles M. Upham, Engineer-Director, American Road Builders' Association.

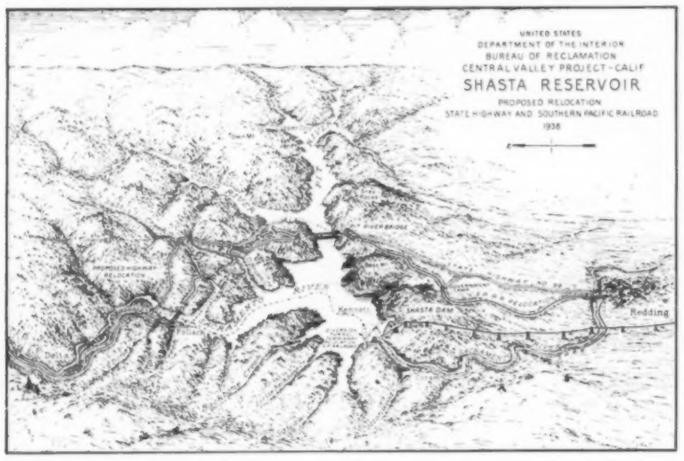
All of these men who are generously serving in the capacity of judge for these CONTRACTORS AND ENGINEERS MONTHLY Awards are unanimous in recognizing the importance of roadside development.

Murray D. Van Wagoner sums up the general opinion in his letter of acceptance to the invitation to serve as judge:

"A hard-surfaced roadway is no longer the ultimate objective of highway engineers in developing a modern highway system. The appearance of the highway has become an increasingly important factor. Through intelligent programs of roadside development, engineers and contractors are making highways pleasant to drive over from a scenic standpoint instead of scars across a once beautiful landscape. Best of all, they are receiving encouragement in this work from the public and from within their professions."

Shasta Dam—King Pin

In Huge Flood Control And Irrigation Project



(Photos on page 40)

✦ SHASTA DAM, now being built 12 miles north of Redding, Calif., by the United States Bureau of Reclamation, is to be a multiple-purpose structure functioning as a monitor of the Sacramento River in the Central Valley Project. It will be the second largest concrete structure in the world, slightly exceeding Grand Coulee Dam in height but less in volume.

This Central Valley of California is in reality two valleys, that of the Sacramento coming from the north and of the San Joaquin River coming from the south. The rivers meet at a point near Stockton and empty into a 550-mile network of channels and sloughs comprising the Sacramento-San Joaquin Delta on one of the arms of San Francisco Bay. Much of the land in this great area has been developed agriculturally through irrigation, principally by pumping. But in recent years the shortage of water in the southern San Joaquin valley has been causing the lands to revert to desert. Some 50,000 acres have already been abandoned and 200,000 acres more are threatened in the immediate future. The wells run dry and deeper pumping is economically prohibited.

Coupled with this are the devastating floods of the Sacramento, seasonally out of step with the agricultural requirements, and the encroachment of salt water from San Francisco Bay upon the rich Delta lands, due to low river flow in the autumn. All in all, a situation has been developing that seriously threatens this inland agricultural empire supporting a population of almost a million people.

This Central Valley Project created to meet the situation is one of the greatest reclamation enterprises of history. Conceived as far back as 1873, it was finally adopted by the Federal Government in December, 1935. Its object is primarily to store water and redistribute it. Electric power will also be developed at Shasta Dam for pumping and for industrial, agricultural and municipal purposes. In addition, this dam will restore navigation on the Sacramento as far north as Red Bluff.

The Central Valley Project features two dams. One is the Friant Dam toward the south end, which will create an irrigation and flood-control reservoir on the San Joaquin River where it flows out of the Sierra Nevadas. A canal 160 miles long will take the bulk of the water south to the Kern River near Bakersfield, restoring water to the south end of the San Joaquin valley. A shorter canal will irrigate a section north of Madera.

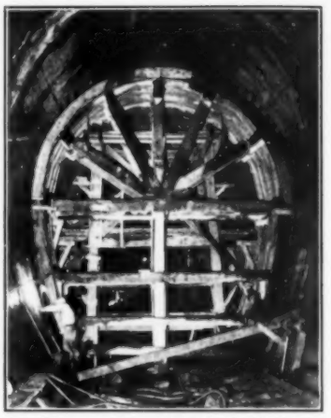
(Concluded on page 21)

Relocation of Railroad And Highway, Which Must Precede Work on Dam, Is Progressing Rapidly

✦ BOUND in with the construction of Shasta Dam is the relocation of 30 miles of the Southern Pacific Railroad. At present, this follows the tortuous canyon of the Sacramento from Redding to Delta Station. The relocated high-line is being constructed over the ridge to the east of the present line and is much straighter and the grades far less severe. The relocation is characterized by twelve tunnels and eight major bridges.

There will also be about 15 miles of highway relocation on No. 99. Two and a half miles of this, paralleling and adjacent to the railroad relocation, is now being graded in conjunction with the latter. The remaining 12½ miles will probably be advertised and contracted by the State of California under an agreement now pending between the Bureau and the State Highway Department.

One of the largest jobs scheduled in the railroad relocation, which will be advertised this autumn, is a high, double-deck bridge across the Pit River, to carry both railroad and highway over an arm of the reservoir. It will be the highest double-deck bridge in existence, rising 500 feet above the present river surface. The length will be 3,590 feet, with the lower deck providing for two railroad tracks and the upper deck for four lines of highway traffic. Two of the piers, founded on rock as much as 70 feet below the ground surface, will be 400 feet in height. Construction will involve 200,000 cubic yards of excavation, 90,000 cubic yards of concrete, 3,600 tons of reinforcing steel and 16,400 tons of structural steel.



The Form Used in the "Plug Section" of the By-Pass Tunnel Under Shasta Dam

Dirt is now flying and drills eating into tunnel faces on most of the sections into which the work has been divided. Starting at Redding, these sections and contracts line up as follows:

Redding Bridge is the first crossing of the Sacramento River. The contract for the substructure was awarded to Clifford A. Dunn, Klamath Falls, Ore., for $173,320.00 and the steel and erection of the superstructure to the American Bridge Co. for $569,100.00.

Work on the first grading section, approximately 12 miles, is now under way by Granfield, Farrar & Carlin of San Francisco, which received the contract on its bid of $812,380.90.

The contract for Tunnels 1 and 2, amounting to approximately 1.5 miles with a short fill between, was awarded to the West Construction Co. of Los Angeles, on its bid of $904,981.00.

Bids for the two contracts for the Pit River Bridge, the substructure and the superstructure, will be advertised this autumn.

The contract for Tunnels 3, 4, 5, 6 and 7, totaling approximately 4.5 miles and including the grading between, was awarded to A. Teichert & Son, the United Concrete Pipe Corp. and Ralph A. Bell on their combined bid of $1,857,567.50.

The next section of 4 miles includes two bridges, three tunnels and grading. Bids for the construction of the 1,395-foot Salt Creek Bridge and O'Brien Creek Bridge, which will be 1,032 feet long, were received August 14 but the contracts for the work had not been awarded when this article was prepared. R. G. Clifford of San Francisco, which was awarded the contract for Tunnels 8, 9 and 10 with grading on its bid of $1,223,136.40, sublet the grading to Granfield, Farrar & Carlin.

The contract for the substructures of Pollock Bridge (the second crossing of the Sacramento) and Doney Creek

(Concluded on page 20)

COMPARISON OF CENTRAL VALLEY PROJECT WITH OTHER LARGE CONSERVATION PROJECTS

	Central Valley Project		Boulder Canyon Project	Columbia Basin Project	Tennessee Valley Authority	
	Shasta Dam	Friant Dam	Boulder Dam	Grand Coulee Dam	Norris Dam	Wilson Dam
DAM						
Height (feet)	560	300	727	550	265	137
Crest length (feet)	3,500	3,430	1,282	4,200	1,872	4,860
Concrete mass (cubic yards)	5,600,000	1,850,000	4,360,000	10,250,000	1,195,000	1,331,000
Power installation (horsepower)	515,000	none	1,835,000	2,700,000	134,000	600,000
RESERVOIR						
Capacity (acre-feet)	4,500,000	520,000	30,500,000	10,000,000	3,350,000	500,000
Length (miles)	35	15	115	151	72	15
Surface area (acres)	29,500	4,500	146,500	82,000	34,200	———
MAIN CANALS						
Total length (miles)	350		210	190	none	
Irrigable lands (acres)	2,000,000		1,900,000	1,200,000	none	

Roadway Maintenance At 1939 World's Fair

Repairs by Contract Keep Roadways and Walks in a Satisfactory Condition for This Year and Next

(Photo on page 40)

✦ THE construction of the bituminous roadways and walks at the New York World's Fair on the Flushing Meadows was described in considerable detail in CONTRACTORS AND ENGINEERS MONTHLY, April 1939, page 2. The problems of maintaining these pavements where concentrated bus traffic uses them and the cleaning of all paved areas are the subject of this article.

The Pavements

It will be recalled that the subgrade of the entire Fair area is a refuse dump of long standing which covered an old marsh. This naturally does not furnish the best of foundations, and led to the choice of a type of pavement which could be repaired easily in case of settlement and also where repairs could be made readily when the many necessary service cuts were made during construction of the Fair and thereafter. The pavement base consists of 4 inches of 1 to 3½-inch crushed stone rolled dry and choked with screenings or sand. On this is 2 inches of binder course comprised of ¼ to 1-inch stone with 3 to 5 per cent asphalt and then a surface course 1 inch thick comprised of ⅛ to ⅝-inch stone with 5 to 7 per cent asphalt and from 0.5 to 1 per cent hydrated lime. The bus roads are 22 feet wide and the walks and other roadways are of varying widths.

On an average day there are 100 buses in operation, making 1,200 stops at each of the 45 stations and on a maximum day about 2,000. Each of the Greyhound buses which carry visitors completely around the Fair grounds weighs 19 tons loaded and the entire weight is on four wheels fairly well balanced. Each of these buses is 9 feet wide overall. With the 22-foot roadway and the traffic from both directions it means that operation is practically grooved. Where the foundations are poor there have been some breaks in the pavement at bus stations, which has necessitated constant attention to repairs.

The other cause for repairs has been the pavement cuts, of which 400 were made in the month of April prior to the opening of the Fair, one-half of these being in the Amusement Area where concessionaires were then installing their amusement devices. The cuts were caused by all kinds of services, including water, gas, electric, telephone and sewer lines. All of the trenches involving pavement cuts were backfilled with native material and hand tamped.

(Concluded on page 16)

An Electric Shovel Mucking at the Face of the By-Pass Tunnel Driven Under the Right Abutment Area of Shasta Dam by the Colonial Construction Co.

SYRACUSE FORGES AHEAD

toward its second million square yards of TEXACO Asphalt paving

A TEXACO Sheet Asphalt pavement under construction on James Street, Syracuse, N. Y. Three miles of this thoroughfare are TEXACO-paved.

Its 1,000,000th square yard of TEXACO Asphalt paving was laid by Syracuse, N. Y., several years ago. From the standpoint of durability, economy and safety, New York State's fourth largest city unquestionably is completely satisfied with its TEXACO-paved streets. The simple fact that it already has constructed 1,000,000 square yards and is well on the way toward its second million, is strong proof of this.

Be guided by the experience of Syracuse on your next Asphalt road or street job. Whether it is a heavy-duty plant-mix or penetration macadam pavement, one of the intermediate type surfaces calling for a Cutback or Emulsified Asphalt, or an inexpensive surface-treatment, use the recommended TEXACO product. The adhesive, waterproof, weather-resisting qualities of all TEXACO Asphalts insure lasting, economical service.

Helpful booklets on Texaco Asphalt street and highway types are available for interested engineers, contractors and public officials. Send for them.

TEXACO ASPHALT

THE TEXAS COMPANY, *Asphalt Sales Department*, **135 East 42nd Street, New York City**

Chicago Cleveland Kansas City Houston Jacksonville Buffalo Philadelphia Richmond Boston

Contractors and Engineers Monthly

THE NATIONAL BUSINESS PAPER OF THE CONSTRUCTION INDUSTRY

Member of Controlled Circulation Audit

Issued Monthly by Buttenheim-Dix Publishing Corp.

Editorial and Business Office: 470 Fourth Ave., New York City

Printed in Mount Morris, Ill., U. S. A.

THEODORE REED KENDALL, Editor

TOM DIX, President — O. E. POTTER, Managing Editor

GEORGE S. CONOVER, Vice President — MYRON MacLEOD, Advertising Manager

DONALD V. BUTTENHEIM, General Manager — HERBERT K. SAXE, Treasurer

EDGAR J. BUTTENHEIM, Publisher

BRANCH OFFICES

Chicago, Ill., Daily News Bldg., Tom Dix, President

Cleveland, Ohio, 648 Hanna Bldg., George Conover, Vice President

San Francisco, Calif., Mills Bldg., Duncan A. Scott

Los Angeles, Calif., Western Pacific Bldg., August C. Belden

Copyright 1939 by Buttenheim-Dix Publishing Corp.

"Tooling" for Highways

The basic manufacturing industry is the machine tool industry. We hear much about "tooling" the automobile industry, and more now about the airplane and munitions industries. Why not more about the highway industry? We can well afford to mechanize the highway industry more than it is at present. It is true that the actual number of men employed in the field has been reduced through the existing amount of mechanization, but we foresee a greater program of construction that will employ many more men because of its very magnitude, and the call for machines that will further reduce costs will be insistent.

The highway industry is in danger of fading, due to the continued intensive vote-getting ability of relief through one loop hole or another. There is more than a ray of hope, however, in the increasing number of states where anti-diversion amendments have been voted by taxpayers, practically all of whom are automobile owners, to curb the sapping of needed highway funds for every other purpose on the political calendar.

With the money available from normal gasoline taxes used entirely for highway service, and eliminating Federal and other "emergency" gasoline taxes which were enacted chiefly for relief purposes anyway, we can establish a greater highway construction and maintenance program that will be nationwide. Such a program can start at either end of the scale and be carried out systematically because the excellent state highway planning surveys have made available accurate knowledge of the real needs of the states and their communities.

Without detailing the needed program of improvement which would include our older Federal routes that have long since ceased to have pavements smooth and wide enough for modern traffic, elimination of danger points of all kinds, improvement of secondary roads, extension of state aid and supervision to county and town roads, etc., its great extent and the vast benefits that would accrue to all industry, and to all classes of people is all too apparent to need delineation.

Thus "tooling" the highway construction industry will mean a greater activity for the basic machine tool industry, because the American ingenuity which has created the mud pump, the road and plant-mix machines, the longitudinal finisher, the bituminous spreading and finishing machines, the dual-drum paver, and many others, will create more new machines to aid in carrying on America's broadest, most beneficial, service industry, highway construction, a billion dollar industry that can be continued at the normal pace by the regular contributions of the users of highways. Employment, direct, indirect and future through the highway transport field, thus can be definitely increased through a greater highway activity. How much better to increase employment in the United States through the stimulation of a service industry beneficial to all, than through the creation of equipment or materials for the destruction of civilization.

Allotment to P. R. A. For Research Building

Announcement has been made of the approval of an allotment of $1,450,000 by the Public Works Administration to the Public Roads Administration for the acquisition of a site and the construction of buildings and other necessary facilities for testing and research work.

The present P. R. A. Abingdon Laboratory will be occupied by the Civil Aeronautics Authority. This laboratory was established prior to the selection of Gravelly Point as the site for the Washington National Airport.

Tom Dix

The passing of Tom Dix, President of CONTRACTORS AND ENGINEERS MONTHLY, who died at his home in Kenilworth, Ill., on September 24, after a long illness, is a profound loss. A member of this organization since its inception, Tom Dix's contribution to the development and progress of CONTRACTORS AND ENGINEERS MONTHLY has been immeasurable. Ever looking forward, he was able to gage how the publication might best serve its field and he was always steadfast in his loyalty to its ideals and standards of service which he helped to formulate.

To those of us who worked with him, our personal loss is equally as great, for his radiant personality, his courtesy, his kindness and consideration made business or personal relationship with him an inspiration and a joy.

Tom Dix was born on January 24, 1889. Most of his business life was spent in Chicago. After considerable experience in other publishing fields, he joined THE AMERICAN CITY Magazine in 1913 as its Chicago representative. Soon after CONTRACTORS AND ENGINEERS MONTHLY began publication in 1920, the Buttenheim-Dix Publishing Corp. was formed and Mr. Dix became its Vice President, as well as serving as advertising representative for both publications in Chicago. In 1932 he was elected President and served in that capacity until his death.

Those of us who have been associated with him in this organization feel that the finest memorial we can create for him is a rededication of our efforts to maintaining for CONTRACTORS AND ENGINEERS MONTHLY the ideals and service to its readers, to which Tom Dix gave so much of his energy and constructive thought, and to make his vision of the future of CONTRACTORS AND ENGINEERS MONTHLY a reality.

Tom Dix

Trans-Andean Road Tunnel

It is reported by the U. S. Bureau of Foreign and Domestic Commerce that the railway tunnel through the Andes connecting Argentina to Chile will be reconditioned to permit the passage of automobile traffic. The Argentina National Highway Commission states that there is sufficient room on one side of the railway tracks for a narrow highway which can be paved at relatively low cost.

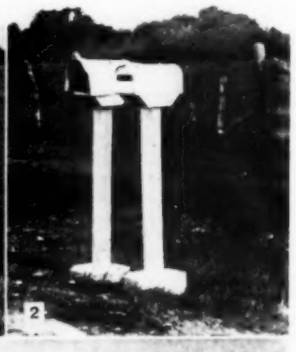
Present plans call for the inauguration of this work in the near future, and it is expected that it can be completed by the end of this year. Transit over the Andes is now suspended for about seven months of the year on account of the passes being blocked by heavy snowdrifts. By reconditioning the railway tunnel, automobile traffic will be possible for nine months of the year.

This projected highway tunnel will be used until the proposed 5-mile tunnel through the Andes is constructed to form a part of the Pan-American Highway.

RURAL MAIL BOXES IN TEXAS

1. and 2. Before—and After. 3. A Typical Installation of a Single Box. 4. Same as 3, But from a Distance, Showing the Shoulder Stabilized with Gravel to Prevent Rutting. 5. The Boxes and Supports Are Easy to Move When Shoulder Maintenance Is in Order. 6. A Neat Multiple Installation. 7. A Well-Appearing Group of Large and Small Boxes, Neatly Stenciled and on One Long Support. **See Page 26.**

1



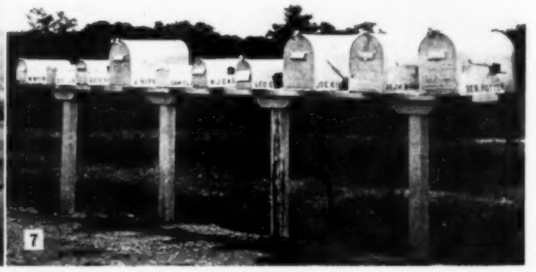
2

3

4

5

6



7

More than a maintenance unit

HAS WIDE RANGE OF BLADE ADJUSTMENTS

Bank cutting is no great task for the Galion No. 210 pull grader shown above. It has manual control and a wide range of blade adjustments. Bulletin No. 234.

Galion tandem roller (above) for compacting surfacing material. Sizes from 5 to 14 tons. A Junior Patrol motor grader is shown right above. Also standard models.

For efficient removal of snow try the Galion snow-plow attachment. Attached to the big heavy duty model it will prove ideal winter equipment. A highway sander for spreading chips, slag, rock salt and calcium chloride on icy roads and streets is also pictured.

Galion Chief 3-wheel roller with spoke wheels and diesel engine. Also trench, tandem, portable and sheepsfoot rollers.

ADJUSTMENTS

When we say that this Galion HEAVY DUTY motor patrol is "more than a maintenance machine" we mean just that. Its great range of blade adjustment permits it to perform not only general maintenance work but the heaviest kind of construction where the blade must dig in . . . and where shoulder work and ditching are the requirements.

This Galion HEAVY DUTY motor patrol does the kind of work which heretofore only a pull grader could perform. The illustrations at the right show the various duties which can be done by this powerful and economical unit.

Before you decide upon a grader study these features:

- Narrow box-type frame gives full visibility of work
- Full hydraulic control with fingertip action
- 66 H.P. Diesel engine mounted over rear axle (or 60 H.P. gasoline engine)
- 12-ft. moldboard rigidly braced and fully adjustable to make any kind of blade cut (fully reversible)
- Double drive with all four wheels working under all conditions of travel
- Wide front axle has high clearance to straddle windrows
- Leaning front wheels hold blade to its work
- Send for Bulletin No. 237 which gives engineering data and specifications.

Galion also builds the most complete line of rollers to be found anywhere . . 3-wheel tandem, trench, portable and sheepsfoot (two are illustrated at the left); a complete line of pull graders in various types and sizes with manual or hydraulic control; stone, asphalt and chip spreaders; sanders; snow-plow attachments; scarifiers and other accessory equipment. Send for complete data.

If it's road building and maintenance . . it's a Galion low-cost unit you will need. Your order will be given prompt attention.

CUTTING DITCH

SHOULDER TRIMMING

WORKING IN REVERSE

GRADING—LEVELING

THE GALION IRON WORKS & MFG. CO.

Main Office and Works: Galion, Ohio

EXPORT DIVISION: COLUMBUS, OHIO

INTERNATIONAL DISTRIBUTION

An Installation of Bethlehem Cable Guard Rail on Indiana State Route 31

Offset-Type Brackets For Cable Guard Rail

In the installation of guard rail shown in the illustration, 2,200 feet of Bethlehem guard-rail cable is employed in nine runs on Indiana State Route 31 near Peru. The offset brackets shown above withstand pressure up to 15,000 pounds before flattening and Bethlehem also makes a bracket with an ultimate strength of 10,000 pounds which is simple and rugged and fully meets the requirements of most locations.

The Bethlehem Steel Co., Bethlehem, Penna., now supplies all material required for a complete guard-rail installation, including cables, steel posts, brackets and all fittings. The most popular Bethlehem guard rail cable is the three-strand type, with seven wires to the strand, and normally ¾ inch in diameter. Heavy galvanizing is usually specified and is being supplied to county and state highway commissioners throughout the United States, according to the manufacturer.

While wood posts are most frequently used in guard rail installations, the Bethlehem Steel Co. reports that many users are finding steel posts cheaper, installed, than wood, due to the fact that steel posts arrive on the job cut to length and properly drilled and therefore are cheaper to set and align.

1940 Road Program

An outline of the 1940 highway program, based on conferences with representatives of the Public Roads Administration, War Department, Department of Commerce, State Department, Public Works Administration, and a number of senators and congressmen who take an active part in national highway legislation, has been prepared by the American Road Builders' Association.

These representatives were unanimous in their conclusions that the authorizations already made for Federal Aid for the fiscal year ending June 30, 1941, will not be disturbed. From a study of the programs of the various state highway departments, it appears that these will remain about as they are for the calendar year.

At the next regular session of Congress new Federal-Aid highway legislation will come up for consideration. It is expected that the authorizations will be increased over what they are at the present time, for several reasons. First, it is thought that the amount of Federal Aid should be more nearly in line with the motor vehicle excise taxes paid to the Federal government; second, there is an absolute need for more defense highways, as pointed out by the War Department; and third, the report of the Public Roads Administration shows the immediate need for a system of inter-regional and secondary highways to meet traffic demands.

Currently, road and street construction is running well ahead of the same period last year, a trend which has continued for 3 years and is expected to continue for some time. The uptrend is due principally to increasing highway use, resulting in more revenues for highways with a reduction in diverted funds.

The European war increases the possibility of augmenting the present program by constructing certain portions of the inter-regional highway system which are already overtaxed.

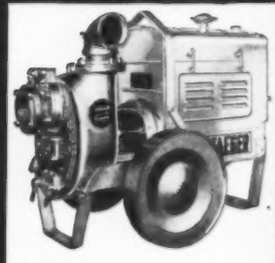
It is expected that the 1940 highway construction program will run considerably more than the $1,500,000,000 which is now annually spent for the construction of streets and highways.

New 5.5-Hp Engine

The new Caterpillar single-cylinder 5.5-hp engine, known as the Model 300G, is particularly designed for pumping jobs, where horsepower requirements are low and the minimum of attention is desirable. With no water to freeze or boil away, and with an unusually large lubricating oil sump, this new engine can run for long periods of time without attention, according to the manufacturer.

The 300G is offered as a complete unit, equipped with a Caterpillar clutch, and is of sturdy construction, with an air cleaner and built-in governor. A new specification sheet with full details on this new engine may be secured direct from the Caterpillar Tractor Co., Peoria, Ill., or from this magazine.

BUYING A PUMP?



INSIST ON:

- Faster, 100% Automatic Priming
- Greater Efficiency in Any Size, at Any Lift
- Thousands of Hours of Heavy Duty Service
- Cut your Costs with "Sure Prime" Pumps—1½" to 10" Sizes, Capacities 3000 to 220,000 G. P. H. Send for New Catalog and Prices.

THE JAEGER MACHINE CO.
701 Dublin Ave., Columbus, Ohio

JAEGER

Rely on BAKERS to Get Thru!

Landside Snow Plow on an Ohio highway.

For more than thirty years the name BAKER has stood for dependability in snow plows—the ability to get through. Safety, strength and operating ease are built into each of the 21 models of Baker Truck Snow Plows. Tripping blades—scientifically curved moldboards—sturdy push frames—efficient hydraulic lift—these are only a few of the many features that have won nation-wide leadership for Bakers. You're always ready with a Baker.

Tractor Snow Plow banking snow in Vermont.

Baker Snow Plows are built for many models of tractors, large and small, as well as for motor patrols.

BAKER SNOW PLOWS

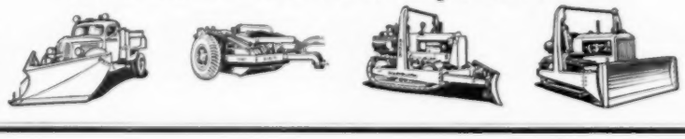
Ask for latest Baker Snow Plow Bulletins. Give name and model of truck or tractor on which snow plow is to be mounted.

THE BAKER MFG. CO.
585 Stanford Ave., Springfield, Illinois

America's Oldest Manufacturer of Snow Plows for Streets and Highways.

BAKER TRACTOR EQUIPMENT

★ SNOW PLOWS SCRAPERS MAINTAINERS



★ BULLDOZERS GRADE BUILDERS ROOTERS

New Spandrel Arch Bridge Over Flashy Texas Stream

Onion Creek Bridge Built Near Austin By Cage Bros. And L. A. Turner; Methods And Design of Interest

(Photo on page 40)

✦ FOUR years ago the spandrel arch bridge at New Braunfels, Texas, was completed and described in the December, 1935, issue of CONTRACTORS AND ENGINEERS MONTHLY. A tinted photograph of the structure hangs in the office of G. G. Wickline, Bridge Engineer, Texas Highway Department. Soon another similar photograph may hang there, as an equally attractive spandrel arch bridge was recently completed by Cage Bros. and L. A. Turner of Bishop, Texas, over Onion Creek about 12 miles southeast of Austin on State Route 29. The bridge consists of four 95-foot clear spans with spandrel arches, a single 43-foot girder span with a false outside soffit at the north end and three similar spans at the south end, both abutted by modified cellular-type abutments with no slab on the riding surface.

Design

The arched ribs of the 95-foot spans carry eight spandrel arches of 10 feet 9 inches span each center to center. At the spring line the arched rib is 3 feet 3¾ inches deep and 6 feet wide while at the top of the arch it is reduced to 1 foot 6 inches deep and the same width. The reinforcing for the rib consists of twelve 1-inch square rods, six top and six bottom, lapped 4 feet and welded with a 5 16-inch continuous electric weld.

The spandrel columns, carried on the rib, are 17 inches x 5 feet and reinforced with ten ⅝-inch round bars vertically tied in with rings of reinforcing. These columns support the transverse brackets which have a span of 13 feet 9 inches with a 1-foot radius fillet at the ends. These brackets are reinforced with three 1-inch square bars and ½-inch stirrups spaced 12 inches on centers. The brackets are 15 inches thick and 3 feet 2 inches high. They support the 10-inch roadway slab measuring 27 feet between curbs which are 12 inches high. There are two 2½-foot sidewalks known as "refuge walks." This is a step in the right direction as too much space has been wasted in the care of pedestrians on bridges. All they actually need is a real refuge walk to protect them from passing vehicles. Bridges are seldom places for the multitude to promenade en masse.

The spandrel arches tie in one foot below the transverse brackets. They have a radius of 5 feet 10½ inches and are 9 inches thick, 1½ feet deep at the top and 2 feet 5 inches thick at the ends. They are reinforced top and bottom with a total of twenty ⅝-inch round bars.

As a decorative as well as a safety measure the curb carries a structural steel rail of standard pipe and channels which can be seen through as one drives over the bridge. It is sometimes wondered how many bridge accidents are caused by the attractive almost solid concrete hand-rails on bridges, so solid that the automobile driver cannot readily see over the edge and rises slightly in his seat for that fatal peek. The standard panels on the Onion Creek bridge are 9½ feet on the approach spans and 9 feet on the arch structure. The posts are 3 feet 4 inches high and measure 1¼ x 1 foot in cross section. The rail is at a height of 3 feet. The rail is painted black to contrast with the concrete posts.

C. & E. M. Photo

A Steel Truss Centering for the Arched Rib. The Framed Timber Bent Was Used Only for Erecting the Self-Supporting Trusses

Pier 3—Typical Construction

From 4 to 6 feet of sand and gravel underlaid with limestone constituted the foundation material for the bridge piers of which No. 3 is typical. Excavation was started over an area of 26 x 36 feet at the surface, reducing on a 1½ to 1 foot slope. The work was done with a ½-yard Insley dragline down to rock with the water being removed from the pit by a 4-inch Jaeger Sureprime pump. As

(Continued on page 19)

GRIFFIN
WELLPOINT SYSTEMS
DRY WET JOBS AT A PROFIT!

Write for new catalog, "Pointed Wellpoint Facts"

GRIFFIN WELLPOINT CORP.
725 East 140th St., New York, N. Y.
Phones: MElrose 5-7704-5

LINE UP YOUR 1940 EQUIPMENT

Get this Guide FREE

● Time to look over your plant — get your equipment all lined up so that 1940 will be a big money-making year. Here's just what you need to do the job right — the Telsmith Equipment Guide.

It will tell you *what's new* in rock, ore and gravel handling machinery — exactly which type, model or size best fits your special need ... and why. 36 pages ... with illustrations to tell you what words can't. And it's yours, *free for the asking!*

You'll want to see Telsmith's new developments — equipment that embodies every modern feature of design — from the standpoint of speed, capacity, trouble-free operation and lower up-keep.

And you will want to know about Telsmith Balanced Service, too. Telsmith's alert, experienced engineers will plan and equip your plant throughout — completely co-ordinate its operation—*and guarantee results.* Get Telsmith's Equipment Guide E-34.

SMITH ENGINEERING WORKS
4014 N. HOLTON STREET • MILWAUKEE, WISCONSIN
Associates in Canada:
Canadian Vickers, Limited, Montreal—Gordon Russell, Ltd., Vancouver
50 Church Street, New York City
211 W. Wacker Drive, Chicago, Ill.
713 Commercial Trust Bldg., Philadelphia, Pa.
81 Binney St., Cambridge, Mass.
Brandeis M. & S. Co., Louisville, Ky.
Vam Wheeler Equip. Co., Columbus, Ohio
Roanoke Trac. & Equip. Co., Roanoke, Va.
Choctaw C. & M. Co., Memphis, Tenn.
EC-2-39

TELSMITH

De Ruyter Bros., Road Contractor of Willmar, Minn., Uses This Unit for Transporting Heavy Equipment from One Road Job to Another. The Unit Consists of a Ford V-8, 95-Hp Tractor with 2-Speed Axle and a LaCrosse Trailer. One of Its Features Is the Winch Operated by a Power Take-Off for Pulling Machinery on to the Platform of the Trailer

Dragline Built Levee and Ramp

Army Engineer Department Used 230-Ton Machine to Handle Work at Vidalia, La., Emergency Levee

(*Photo on page 40*)

✦ AS PART of the Vidalia, La., emergency levee program opposite Natchez, Miss., the U.S. Engineer Department had to build a new ramp for the Vidalia-Natchez Ferry, as the old location of the ferry landing had to be changed because of the levee set-back. Although the quantities were not large, 1,500 yards to build the new ramp, and to remove 14,000 yards from the river bank to form a landing slip, the big steam dragline U.S.E.D. B-13, which was available at the Natchez yard of the Department, was brought in as it could handle the work rapidly ahead of the 1939 spring high water and could also be used later on a 100,000-yard emergency set-back after the houses of the town between the old and new levee locations had been moved.

The B-13

The B-13 is a Bucyrus-Erie steam-operated machine with a 160-foot aluminum boom working with a 6-yard Page basket-type bucket. The machine operates on steel track laid in 15-foot sections with seventeen on each side. Each section carries two 90-pound rails, two steel stringers and nine 8 x 12-inch by 10-foot cross ties and accessory parts. Each section has a bearing area of 10 x 15 feet and weighs approximately 11,000 pounds. The gage of the single track is 3 feet 3 inches center to center of each rail and the gage of the double track is 26 feet center to center of each section.

The capacity of the machine varies from 4,000 to 8,000 cubic yards per 24 hours, depending on the nature of the work. The operating crew for the 230-ton machine consists of: one overseer, one clerk, three operators, three firemen, three pumpmen, three spotters, one repair man, and eighteen laborers. This crew is for 24-hour operation.

The B-13 is assigned to the Second New Orleans District, U. S. Engineer Department, Lieut-Col. William F. Tompkins, District Engineer, and is based at the Natchez Area Yard, when not in service.

Fighting Winter Snows

Literature describing Walter Snow Fighters for heavy snow removal work has recently been issued by the Walter Motor Truck Co., 1001-19 Irving Ave., Ridgewood, L. I., N. Y. Features of these heavy-duty units include Walter 100 per cent traction and the available power provided by the Walter 4-point positive drive.

Interested state and county highway engineers may secure copies of literature on Walter Snow Fighters direct from the manufacturer or from this magazine.

New Melting Kettles for Tar, Pitch and Asphalt

For every purpose requiring the heating and melting of tar, pitch, asphalt, or any bituminous material, there is a Heet-Master model to fit the needs, according to the Aeroil Burner Co., Inc., West New York, N. J., as they are made in various sizes from 40 to 300-gallon capacity, mounted on quick load skids or pneumatic-tired trailers. A feature of this kettle is the removable immersion tube heating unit which places the heat in the material, instead of under it, thus eliminating burnt-out bottoms and saving 50 per cent on fuel, according to the manufacturer. As the burner itself is in the kettle, hot stuff is produced in a short time. It is of sturdy construction, easy to clean, and burns kerosene, coal oil, range oil, or light furnace oil.

Construction details of the various models are described and illustrated in Catalog No. 182 which the manufacturer will be glad to send to those interested on request.

THE STRONGEST GEARED POWER FOR ITS WEIGHT IN THE WORLD

ALL STEEL HAND HOIST

SEATTLE, U.S.A.

COMPACT—POWERFUL—SAFE

"For use where power is not practical or available"

Manufactured in 2, 5 and 15-Ton Sizes. For capacity comparison, ½" cable used:

2-Ton "Lightweight" ..... 75 ft.
5-Ton "General Utility" ..... 250 ft.
15-Ton Triple-Geared "Special" ..... 1200 ft.

Patent instant gear change and positive internal brake that never fails, and will lock load. Price, f.o.b. Seattle

Gear Ratios	Weight	
2-Ton 4, & 22 to 1	60 lb.	$ 50
5-Ton 4, & 24 to 1	110 lb.	$ 75
15-Ton 4, 19 & 109 to 1	680 lb.	$250

BEEBE BROS.

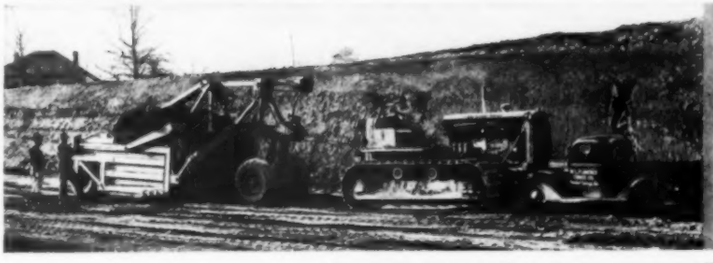
2724 6th Ave., So., SEATTLE, WASH.

Warehouse stocks for dealers' Supply: Seattle—Chicago—Brooklyn—Houston. Complete Literature and List of Dealers in Principal U. S. Cities and Foreign Countries Gladly Mailed.

ROAD CONTRACTOR COMPLETES BIG JOB

AHEAD OF SCHEDULE!

One of the W. L. Florence power shovels in action... with Buck Jenkins in charge. Texaco Crater Compound keeps the wire ropes and heavy gears in condition despite dust and heat.



Caterpillar Tractor and LeTourneau Scraper on the Greenville - Spartanburg super highway job. Texaco fuels and lubricants kept these units working at peak efficiency.

The Florence Co.'s trucks use Insulated Texaco Motor Oil, Insulated Havoline, Texaco Marfak, Texaco Thuban, and are fueled with Texaco Fire-Chief.

Contractor: W. L. Florence Construction Co., Powder Springs, Georgia.

Job: 32 miles of highway in So. Carolina.

Time: Shortest possible. None to lose.

Equipment: 19 pieces of road building machinery and 25 International and Ford trucks.

Fuel and Lubricants: TEXACO 100%.

Result: Job completed ahead of schedule.

EXPERIENCED LUBRICATION ENGINEERS, trained in the selection and application of Texaco Automotive Lubricants, will be glad to demonstrate that savings can be made with Texaco Perfected Lubrication.

For prompt engineering service and deliveries, phone the nearest of our 2279 warehouses in the U. S., or write:

The Texas Company, 135 E. 42nd St., N. Y. C., N. Y.

☆ ☆ ☆

Texaco Dealers invite you to tune in The Texaco Star Theatre—a full hour of all-star entertainment—Every Wednesday Night—Columbia Network—9:00 E.S.T., 8:00 C.S.T., 7:00 M.S.T., 6:00 P.S.T.

TEXACO MARFAK

TEXACO

Mass. Concrete Road Has Rubber Joints

(Continued from page 1)

cut the grade. Four men and a scratch-board checked the grade for final elevation and then back of them two men backed up the forms with gravel on the outside to protect them from any batch material which went over the side. Part of the grade crew went back each morning and pulled the forms, loading them on trucks for hauling ahead.

Batching and Pouring

All of the aggregates were stockpiled at a convenient location at the North Adams end of the job and then rehandled to the bins of the Erie weighing batcher by a Lorain 77 with a 45-foot boom and an Erie ¾-yard clamshell. The dual-pneumatic 2, 3 and 4-batch hired trucks backed under the batching plant, received the batches and then drove about 100 feet to the cement dock where the six bags of portland cement and one bag of Rosendale natural cement were loaded by a crew of four men. The dry batch weights were as follows: sand, 1,260 pounds; ¾ to 1½-inch stone, 1,250 pounds; ¼ to ¾-inch stone, 830 pounds; 6 bags of portland cement and 1 bag of Rosendale cement. This batch was designed to give 6½ bags of cement per cubic yard of concrete.

The trucks drove up the highway, which was maintained open for traffic at all times, and then backed through the forms and to the Ransome 27-E paver, where the batches were dumped into the skip by a man who also took particular pains in cleaning the bodies. The concrete was given a 1¼-minute mix in the paver and then delivered to the subgrade where the steel had been previously placed, as described below. Two men in rubber boots leveled and placed the concrete; two other men outside the forms shoveled excess material from the screed of the Blaw-Knox Ord double-screed finisher which made two passes over the strips in finishing the concrete.

The subgrade was sprinkled ahead of the paver by one of the steel men, using a small hose attached to the paver. Water for the paver was taken from city hydrants along the line of the highway.

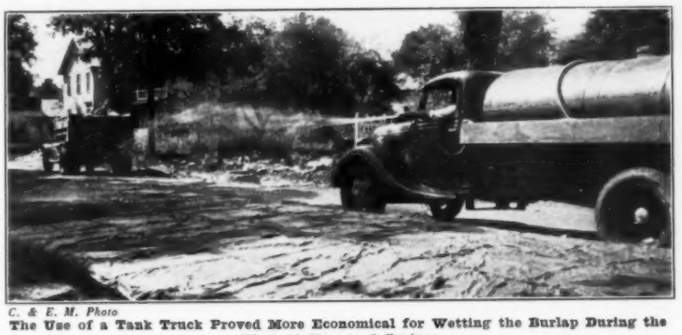
Tied bar mats consisting of eight longitudinal ½-inch round deformed bars, 15 feet long, and three transverse ⅜-inch round deformed bars were tied by the steel men in a frame which spotted the rods exactly. Eighteen pressed metal pedestals were snapped on at the junction of the transverse and longitudinal rods to support the mat, thus making it unnecessary to strike off the concrete in order to have the mat at the proper elevation.

Bethlehem Steel Co. expansion joints with nine triangular pressed steel dowels capped on one side to permit movement in the concrete and held accurately in position by three welded rods were set at intervals of 57 feet 2 inches and with them the ¾-inch premoulded Johns-Manville cork expansion material held in line by a notched steel plate extending to the bottom of the joint on one side and 2 inches down on the other side. All expansion joints were set carefully with a square held at both ends and then spiked to the subgrade at every steel dowel on the fixed side with 60d nails. To permit finishing of the pavement over the joint a 2-inch x 1-inch wood dummy joint was placed on top of the cap, reaching to the finished surface of the pavement.

Finishing and Curing

The two men shoveling at the front screed of the finishing machine carried back concrete to fill low spots when needed. The two finishers used "sleeve-board" floats to smooth out this material and then used a 10-foot Lakewood aluminum straight-edge for checking the surface, after it had been rolled with a 6-foot x 8-inch steel roller weighing about 80 pounds and having a long handle to permit its being used from one side by the finishers. Following the checking, the surface was dragged with a wide canvas belt, giving a herringbone pattern. One of the finishers edged the pavement and pulled up the wood strips on the joints which were edged by the other finisher who also broomed the pavement with a wire broom to give a non-skid finish.

For curing, one of the finishers with a helper spread wet burlap longitudinally from a pair of bridges. This burlap was kept wet by hosing from two Ford tank trucks of 800 and 1,000-gallons capacity with pumps on the power take-off and the hose nozzles operated by the truck drivers from the cab. The second day after pouring, the burlap was doubled and left on for five days and sprinkled constantly. Following that, the burlap was removed and the pavement allowed to cure for one day in air. The pavement was opened to traffic on the eighth day after pouring if the test beams gave indication of developing sufficient strength.



C. & E. M. Photo
The Use of a Tank Truck Proved More Economical for Wetting the Burlap During the First 24 Hours of Curing

Personnel

The contract for the construction of the 2.75 miles of 24-foot concrete paving west from North Adams, Mass., on State Route 2, was awarded to Central Construction Co., Lawrence, Mass., on its low bid of $241,115.10. John E. Higgins, one of the owners, acted as Superintendent on this contract. For the State Department of Public Works Kenneth W. Chase was Resident Engineer.

Le Tourneau Turns to "FLEX-SET" PREFORMED YELLOW STRAND

For economy, users of all kinds of machinery employing wire ropes can profitably follow the example of R. G. LeTourneau, Inc., who recently adopted "Flex-Set" Preformed Yellow Strand as standard equipment on all their famous "cable controlled" machines.

Of course, LeTourneau wants every machine to operate with greatest economy right from the start. Therefore, the decision to standardize on "Flex-Set" Yellow Strand was made only after many rigid tests, and observations right out on the job.

"Flex-Set" Preformed Yellow Strand is a super-rope for super-service, the highest grade product of a company that has made nothing but wire rope for 63 years.

Records of unusual performance are constantly being established by this marvelous rope in road building everywhere, as well as in practically every other industry.

Ask any B. & B. Distributor or Branch Office for full details and prices. There's one in every industrial center.

BRODERICK & BASCOM ROPE CO., St. Louis

Factories: St. Louis, Seattle, Peoria Branches: New York, Chicago, Seattle, Portland, Houston

A 5-Ton Hand-Operated Hoisting Crane

Portable Hoist Crane In 5 to 15-Ton Sizes

A line of portable hoisting cranes, ranging in capacities from the manually operated Junior model, capable of handling 5-ton loads, to the larger 15-ton models, is made by the Porta-Crane Corp., Rapid City, S. D. These hoists are available with any desired boom length and, with the exception of the Junior model, are equipped with gasoline-powered hoisting units. The cranes are of all-steel construction, arc-welded throughout, and all models are equipped with single or dual pneumatic-tired wheels. Provision is made in all models for their attachment to trucks or tractors and for extremely heavy lifting jobs, their attachment to a crawler or heavy wheel tractor is recommended.

The Junior model, which is also available with a small single-cylinder gasoline motor attached to the hoisting unit for power instead of manual operation, is designed primarily for general hoisting and material handling work, while the heavier models, with a built-in gasoline-powered hoist unit, are adaptable to pile driving or dragline work. The ease of transporting these cranes from job to job and the speed at which they can be towed behind a light truck, increases the scope of their usefulness, according to the manufacturer.

Complete information on these Porta-Cranes may be secured by interested contractors and state and county highway engineers direct from the manufacturer by mentioning this magazine.

Road Building, Maintenance And Rock Quarry Equipment

The complete line of Reliance highway equipment for use in construction, maintenance and in quarry work, including portable crushers, bins, screens, bucket elevators, feeders, washers, pulverizers, complete crushing and screening plants, road sweepers, asphalt heating kettles and sand and gravel spreaders, is described in a new 32-page catalog recently issued by the Universal Road Machinery Co., Kingston, N. Y. Photographs of various job installations as well as of the various types of equipment made by this company are included.

Copies of this new catalog may be secured by ifterested contractors and state and county highway engineers direct from the manufacturer by mentioning this item, or from CONTRACTORS AND ENGINEERS MONTHLY.

Reflector Buttons For Traffic Lines

Erickson Owl reflector buttons, made in two sizes with one or two-way showing, are designed to provide safe, reliable and efficient traffic-stripe marking on state and county highways. In 1 and 1½-inch heights, with ½ or ⅜-inch Flecto-Lites, these buttons are furnished complete with expansion bolts and are easily installed.

Complete information on these reflector buttons, as well as on its line of state and county highway and warning signs, traffic paint and Bulls Eye reflectors for marking hazardous points such as bridge abutments, is contained in a complete catalog which the K. E. Erickson Co., Inc., 222 S. W. Stark St., Portland, Ore., will be glad to send on request.

All Types of Snow Plows For Winter Maintenance

Ross Burch-Built snow plows, in one-way, V-type and tri-blade models, available in a variety of sizes to meet all types of winter plowing requirements, are described in Bulletin S. P. 9 which the Burch Corp., Crestline, Ohio, will be glad to send to state and county highway engineers on request. These plows are claimed to be scientifically designed to meet any emergency which may arise in the removal of snow from the highways and have a number of features which are described and illustrated in this bulletin, which also contains detailed specifications of each type.

Ridding Pavements Of Excess Asphalt

A new spray solution which facilitates the removal of excess bituminous material from new brick pavements has just been announced by the Dow Chemical Co., Midland, Mich. This solution consists of 100 pounds of calcium chloride and 40 gallons of water with 6 pounds of starch. Spraying the bricks with this solution after they have been laid prevents the asphalt or tar which is applied to fill the crevices from sticking to the brick and allows the excess to be removed easily.

The hot bituminous material is poured into the crevices and allowed to set. The excess material does not stick to the top of the bricks previously sprayed with this new solution and is easily and economically removed by means of a scraper. The bituminous material so removed may be used again. It is claimed that not only is the bituminous material easily removed but that the appearance of the pavement is improved as well.

CUMMER
Asphalt Plants

All styles and sizes for HOT or COLD Mix

Heavy-Duty Mixers

45 Years' Experience

Write for literature

THE F. D. CUMMER & SON CO.
17th and Euclid Ave.
Cleveland, Ohio

EUCLIDS...
The Turnpike's Choice For
HAULING

Over the new Pittsburgh to Harrisburg Turnpike, through the rugged wilderness of the Pennsylvania mountains, modern construction magic is rapidly creating this great super-highway. On the hauling end are Euclids . . . nearly 100 of them . . . protecting yardage estimates on every contract through their superior, continuous performance. The adjoining views are from the 7-mile stretch under construction by the Central Pennsylvania Quarry Stripping Construction Co., who are using Euclids practically 100%. They recently added 17 big Rear-Dump units, several of which are seen here in action. Visit, if you can, this great project . . . it's worth it. Further, let us send you some very interesting time studies covering Euclid performance on the Turnpike.

There Are Approximately 100 EUCLIDS on the Turnpike

THE EUCLID ROAD MACHINERY CO.
CLEVELAND, OHIO U. S. A.
BRANCH OFFICE 185 EAST BUTLER AVENUE, MEMPHIS, TENN.

EUCLID
THE PIONEER

D.B.S.T. Methods Used In Georgia

Subgrade Stabilized, Top Soil Base, with Surface Treatment and Drag Seal

By Claussen-Lawrence

✦ BETWEEN Newnan, Ga., and Griffin, Ga., on State Route 16, during the summer of 1938 a new grade was opened and a series of contracts completed for subgrade stabilization followed by the spreading and compacting of a top-soil base with double bituminous surface treatment and a drag seal. Claussen-Lawrence Construction Co. had a 9.887-mile section of this work, the methods used on which are described in this article.

The road had been partially graded under another contract but there was still considerable to be done. The road was about one-half in new location. On the grading the contractor used a Lorain 10 ¾-yard shovel loading to eight trucks which had an average 500-foot haul, 1,000 feet being the limit of free haul in Georgia. A 9-yard LeTourneau Carryall scraper was pulled by a D7 for some of the flat grading.

Stabilizing the Subgrade

The stabilized subgrade was 32 feet wide while the primed surface was 21 feet and the completed surface treatment 20 feet wide. The subgrade consisted of about 33 per cent clay, according to the samples taken every 500 feet along the line of the work. Wherever the material changed an intermediate sample was taken. The specifications required not more than 25 per cent clay in the subgrade. The contractor's pit was sampled and the sand that ran the lowest in clay was selected for the stabilizing material. The sand finally chosen ran about 9 per cent clay.

This material was dumped down the center of the subgrade at from 25 to 30 cubic yards per station, averaging 3 inches deep over the 32-foot width. This was spread with a Caterpillar No. 11 Auto Patrol to the 32 feet and then plowed 6 inches into the subgrade with the 3-disk plow shown in the illustration. Then a Roman harrow was used to mix the materials. This 16-disk harrow was pulled by a D7 over the subgrade until the materials showed a uniform color and character. About 4,000 feet of this stabilization of the subgrade was done at a time.

The Top-Soil Base

The top 2 inches of this stabilized subgrade material was bladed out to the sides for shoulder dirt and the subgrade then shaped to a 2-inch parabolic crown. Forms of 2 x 10-inch planks were then set with a 1½-inch cleat on the bottom and staked on the inside. After rolling the subgrade with a 10-ton Galion roller, the space between the forms and for the full 11½-inch height was filled with selected Class A top soil and compacted to 8 inches by controlled traffic for several days, after which the base was ripped an average depth of 3 inches and one cubic foot of stabilized aggregate per square yard of surface added and thoroughly mixed with the upper 4 inches of base. During the final shaping, the top-soil base was wet with a sprinkling truck so that the No. 11 Auto Patrol could work the material to the final crown more easily under traffic. The forms were pulled about 1,000 feet behind the actual dumping of the top soil and ahead of the rolling.

The Surface Course

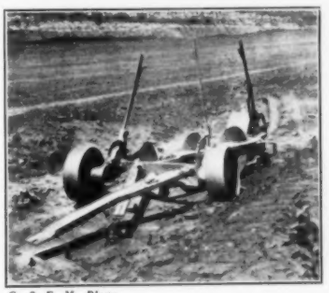
As soon as the base had dried out it was primed with 0.3 gallon of tar per square yard and allowed to cure for ten days to two weeks under traffic after having been closed for about three days until cured out.

On the primed base a hot application of 150-130-penetration asphalt was shot at the rate of 0.4 gallon per square yard and immediately covered with 45 pounds per square yard of 1 to ⅜-inch slag by trucks backing onto the fresh asphalt and spreading the slag from spreader boxes attached to the tail gates. This was hand-broomed to secure a uniform coverage, and keyed into the warm asphalt with a 5-ton roller. Some contractors prefer to use the alternate rubber-tired roller for this work, as the rubber tires press the slag into the asphalt effectively without crushing the material that may be a little high.

When the weather was hot about two weeks was allowed for the slag to key in well with the asphalt and then a tack coat of RC-1 asphalt was applied at 0.15 gallon per square yard and covered with 17 pounds of fine slag per yard and hand-broomed to get a uniform layer. Then it was reshot with 0.25 gallon of the same asphalt and immediately drag-broomed with a broom on wheels. After two or three rounds, rolling began with a 5-ton roller having a board-drag on the last rounds to strike off the surface evenly.

Personnel

The contract for the 9.887 miles of double bituminous surface treatment on a selected top-soil base with a stabilized subgrade on State Route 16 near Griffin was awarded to Claussen-Lawrence Construction Co. of Augusta, Ga., on its low bid of $93,501.37. V. T. Alexander was Superintendent for the contractor, and R. O. Waters, Resident Engineer for the State Highway Board of Georgia.

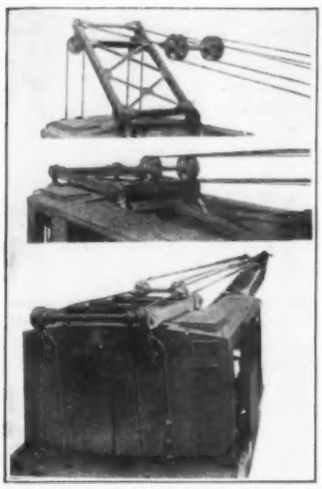


C. & E. M. Photo
The 3-Disk Plow Used for the Initial Mixing of Base and Stabilizing Material

Want information? Write the Editor.

DON'T STEP ON A NAIL!
OUCH! OH!!
Use
Williams Waler Supports
$7.50 per 100
Instead
And incidentally our High Tensile Clamps and Ties are the Best Safety Insurance. 100 lin. ft. cut & threaded, $3.00 for ⅜", $4.00 for ½". Quantity discount. Job lot price.
Williams Form Engineering Corp.
Box 925, Madison Square Sta.
Phone 3-3823
Grand Rapids, Mich.

58 LORAINS!
ONE FOR EVERY 2½+ MILES of the PENNSYLVANIA TURNPIKE
● Here's the world's highest pressure job—22,000,000 yds. of rock and earth excavation let on the fastest working schedules ever set up for a project of this size. There's one make of shovel that stands out on this job both in numbers and performance. It's Lorains all the way along the 161-mile battlefront—58 of them, ranging from ¾- to 2-yd. capacity, at work on contracts totaling 15,000,000 yds. Their selection represents a cross-section of contractor experience from Denver to Boston and North Carolina to Ohio, and testifies to the greater power, speed and staying qualities of Center Drive design.
What these owners want are shovels that will give them the biggest possible profit spread between bid and cost price. They're getting it with Lorains—and so can you. Write for catalogs describing ⅜- to 2½-yd. Lorain shovels and cranes.
THE THEW SHOVEL COMPANY
LORAIN, OHIO
THEW CENTER DRIVE
3/8 to 2½ YD. LORAINS
1¼-yd. Lorain tunnel shovel of the Hunkin-Conkey Construction Company, Cleveland, Ohio, opens West Approach to Laurel Hill Tunnel prior to entering the tunnel proper. (Photo courtesy of Electrified Industry.)
2-yd. L-87 (background) and 1¾-yd. L-79 (foreground) of Hinman Bros., Denver, Colo., average 6000 yds. per 10-hr. day on 405,000 yds. of East Approach and portal of Laurel Hill Tunnel (Hunkin-Conkey Construction Company, General Contractors).



A New Feature of American Gopher Long-Boom Cranes Is the Retractable Mast

Long-Boom Cranes Have New Feature

A retractable mast is a new and exclusive feature of American Gopher cranes of 1½, 1¾ and 2-yards capacity recently announced by the American Hoist & Derrick Co., St. Paul, Minn. This new development, designed for long-boom cranes, consists of a very strong cast strut heavily hinged to the standard mast, as shown in the accompanying illustration. At the top of the hinged strut are two sheaves over which run the ropes from the worm driven boom hoist. One end of the rope is fastened to the counterweight and the other end is fastened to the drums of the boom hoist.

The top of the hinged strut also carries rope sockets for the boom suspension ropes. The boom rope is reeved from the drum of the high-speed boom hoist through the boom to a sheave located close to the boom point, and from there in the required number of parts of line over the boom suspension sheaves. The entire operation of raising and lowering the mast is automatic; the mast is lowered after the load on the boom lines is reduced and raised when the load increases.

For shipping or when low clearance is required, the mast strut lies flat on the roof of the crane cab. When the machine is in close quarters where reduced overall height is an advantage, this can be achieved by warping in on the two lines over the back, which are reeved over the worm-driven boom hoist. Another feature of this arrangement is that the mast top is brought close to the rear end of the machine, which is an advantage when the crane is working with the boom at short radii.

Complete information on this new feature of American Gopher cranes is contained in Bulletin 700-G-11 which may be secured direct from the manufacturer by mentioning this magazine.

New Electrode Gives Smooth Finish Beads

A new arc welding electrode which will facilitate finishing operations on welding jobs by eliminating the need of dressing or smoothing welded seams in many applications has recently been announced by the Lincoln Electric Co., Cleveland, Ohio. This new electrode, known as Fleetweld 10, is designated particularly for finish bead welding on U groove welding in downhand position.

The manufacturer states that the electrode provides full slag coverage, that the bead is uniform and regular without square shoulders, the metal smooths out evenly during welding and the line of fusion with the base metal is practically unnoticeable. Finish beads can be made in V-butt joints in flat position which are flush with the surface of the plates.

Fleetweld 10 can be used with either normal or reverse polarity with direct or alternating current. It is made in two sizes, ¼ and 5/16 inch, in 18-inch lengths and is packed in 50-pound containers.

New Rivet-Heating Forges

The Handi-Gas Forge, one of two new rivet-heating forges announced by the Hauck Mfg. Co., 116-126 Tenth St., Brooklyn, N. Y., in its Bulletin No. 352, is an improvement on the old Midget forge, contains a number of new features making for safety and efficiency, and has a capacity of 300 ¾ x 3-inch rivets an hour.

The other new forge, a double-chamber two-burner oil forge, is a larger unit with a normal capacity of 800 ¾ x 3-inch rivets an hour. Oil-burning forges are equipped with the Hauck suction oil burner which meets all safety requirements.

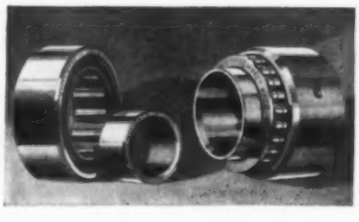
Copies of Bulletin 352 may be secured by those interested direct from the manufacturer or from CONTRACTORS AND ENGINEERS MONTHLY.

B-E Southern Office Moved

The Southern District Office of the Bucyrus-Erie Co., South Milwaukee, Wis., was recently moved from Birmingham, Ala., to 1508 William-Oliver Bldg., Atlanta, Ga. This new office provides a more central point from which to serve the Southern District which includes the states of North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, Arkansas and Louisiana.

P & H SHOVELS have the reputation of being built for heavy going and that is why the manufacturers fortify important operating points with Hyatt Roller Bearings . . . protection for builder and user alike.
P&H

Where the Going is Heavy



GO HEAVY ON HYATTS

Built for heavy going, Hyatt Roller Bearings ask for no soft jobs. And not only do Hyatts help keep equipment in perfect running order while new, but continue to give uninterrupted performance for life of the equipment. Therefore, in considering bearing applications, here's something worth remembering for machine builder and user alike: to keep bearing wear and care out, always put Hyatts in! Hyatt Bearings Division, General Motors Sales Corporation, Harrison, New Jersey; Detroit, Chicago, Pittsburgh and San Francisco.

HYATT ROLLER BEARINGS

NOVO DE-WATERING PUMPS

Novo Self-priming Centrifugal Pumps have gone far in advance of the field. The new design of these pumps eliminates the necessity of air seals on impeller shaft. They have accessibility never before achieved.

Performance that easily meets the standards set by the A.G.C. on all sizes—1½" to 8".

SEND FOR LITERATURE

216 Porter Street

NOVO ENGINE COMPANY
LANSING, MICHIGAN

New Plant for Hough

The Frank G. Hough Co., manufacturer of hydraulic-controlled loaders and other tractor front-end equipment, road blowers and sweeper-blowers, has centered its activities at its new plant in Libertyville, Ill., a suburb of Chicago. The executive offices and the engineering, purchasing and sales departments will be located at the new plant.

Manufacturing will continue at the plant in New Holstein, Wis., which will concentrate on the standard models of Hough equipment while special models and newer equipment will be made at the new plant. The addition of these facilities will double the production capacity and provide ample space and opportunity for experimental work, equipment operation studies and new equipment development.

New Buda Sales Manager

Announcement has been made by The Buda Co., Harvey, Ill., of the appointment of L. F. Shoemaker as Sales Manager of the Automotive and Industrial Division of that company. Mr. Shoemaker joined the Service Department of The Buda Co. in 1920, was transferred to the Sales Department in 1924, and since that time has been located in the New York, Cleveland and Chicago territories.

Evans Joins Gar Wood

Announcement has been made by the Road Machinery Division of Gar Wood Industries, Inc., Detroit, Mich., of the appointment of Arthur C. Evans to the engineering staff. Mr. Evans was formerly associated with Tractor Equipment Division of the Continental Roll & Steel Foundry Co. which was recently acquired by Gar Wood.

General Sales Manager For Brooks Equipment Co.

Brooks Equipment & Mfg. Co., Knoxville, Tenn., has announced the appointment of R. S. Tucker as its General Sales Manager. Mr. Tucker was formerly Vice President and General Manager of the Good Roads Machinery Corp. of Kennett Square, Pa., and is well known throughout the country by contractors and equipment distributors. The Brooks organization manufactures Load Luggers and rock crushers and contemplates extending its line considerably during the coming year.

THE "CATERPILLAR" MOTOR GRADER

DIESEL

THE NEWEST MEMBER OF THE "CATERPILLAR" DIESEL MOTOR GRADER FAMILY! This is the "Caterpillar" Diesel No. 212 Motor Grader on country-road maintenance. Small though it is, you'll find this new machine well suited for every phase of road-work, including construction. It has the traction, power and blade-positions to do an all-around job from bank to bank. Offered with a choice of Diesel or gasoline engine—4-cylinder; 32 b. hp.; four forward speeds; one reverse speed.

The strongest, fastest working motor grader available—the "Caterpillar" Diesel No. 12. This one has a snow-wing which is raised out of the way for the break-through round with a V-plow. The drifts here are crusted and 6 to 8 feet in depth. Plenty of traction and power needed for this job, but the "Caterpillar" Diesel No. 12 Motor Grader has both to spare! Six-cylinder, 66-horsepower "Caterpillar" Diesel Engine . . . six forward speeds. It is working 12 hours a day, in 10-below-zero weather, on only 2 gallons of 9½c fuel an hour!

This is the "Caterpillar" Diesel No. 112 Motor Grader—and shows the high-reach blade in action on a bank-sloping job. This feature is standard equipment on all three sizes of "Caterpillar" Diesel Motor Graders. The No. 112 is offered with a 4-cylinder, 46-horsepower engine (Diesel or gasoline). Four forward speeds.

The machine that's a "Highway Department" IN ITSELF!

No OTHER machine will ever play a more important part in the life of your roads than the "Caterpillar" Diesel Motor Grader. It will be in at the very beginning of a highway—handling *all* or *most* of the construction. And it will carry on after the road is completed—keeping the surface, shoulders, ditches and banks in "new road" condition!

Actually, these machines perform such a wide variety of work that they are practically "highway departments" in themselves. They make ditch cuts . . . high-bank cuts . . . low-bank cuts . . . flat-bottom ditch cuts. They blade and scarify . . . handle a roller . . . clear snow . . . make and maintain shoulders along dirt or hard-surface roads and streets.

In brief, because of an almost unlimited number of blade-positions . . . because of driving-traction to make their blade-range effective . . . and because they can work with many different kinds of attachments, "Caterpillar" Diesel Motor Graders are able to do an entire road job, from bank to bank, all year round!

And these machines, of course, give you the usual "Caterpillar" Diesel operating economies. They need only a few gallons of low-cost fuel for an entire day's work. And their modern design and sturdy construction mean a long life of steady service with a minimum of maintenance-repairs! See your nearest "Caterpillar" dealer for further information. Or write direct. There are three sizes of "Caterpillar" Diesel Motor Graders.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U.S. PAT. OFF.

DIESEL ENGINES • TRACK-TYPE TRACTORS • ROAD MACHINERY

The Cable Divisional Fin Used on the Chicago Outer Drive

New Divisional Fin Tested in Chicago

The experimental construction of a new type of divisional fin on the Outer Drive at 47th Street has recently been completed by the Chicago Park District. Two new types of safety islands at the north and south ends of the fin are featured.

The north island has approaches made of white concrete and is so designed that cars will be deflected from the island proper if they strike it from an angle or off center, or stopped by friction and gravity in case the island approach is straddled. The south island approaches are made of two parallel wire cables inclined from the pavement to the safety island with Federal-yellow colored wood boards between the cables. Cars whose drivers have had their attention diverted will, upon driving on this device, cause the cables to sag, thereby making the wood boards clatter on the pavement and giving a sound warning to the drivers.

Stretching between these islands and two turn-off islands at 47th Street extended are six separate strands of yielding cable, so arranged that it acts as a positive divisional fin. Cars striking this new type of fin are deflected back into their proper channel by the yielding cable. The danger of the car jumping the curb used in the usual type of divisional fin is thereby eliminated.

Experimentation with this type of installation was carried on at the 23rd Street Viaduct in the southbound drive. The tests were carried to destruction and from these tests many new features were developed and added to this device.

Complete Catalog Describes Compressors and Air Tools

A recently issued catalog of Schramm, Inc., West Chester, Penna., describes and illustrates the complete line of compressors and air tools and accessories made by this company. Made up of the various company bulletins, the catalog covers Schramm Utility portable air compressors, the Utility Jr. models, air compressors for truck mounting and power take-off operation, stationary air compressor units, pneumatic tools for construction use, and miscellaneous accessories.

Copies of this catalog and full information on any or all of the items in the Schramm line may be secured by interested contractors and state and county highway engineers direct from the manufacturer by mentioning this item, or from this magazine.

Ten Years of Service Of Experimental Road

Ten years ago the South Carolina State Highway Department and U. S. Bureau of Public Roads built an experimental bituminous-treated road 4.48 miles long on sand-clay and marl bases in Berkeley County, S. C. There were eight sections on marl base and eight on sand-clay base. Three methods of construction were used for the surfaces: mixed-in-place, penetration method and inverted penetration.

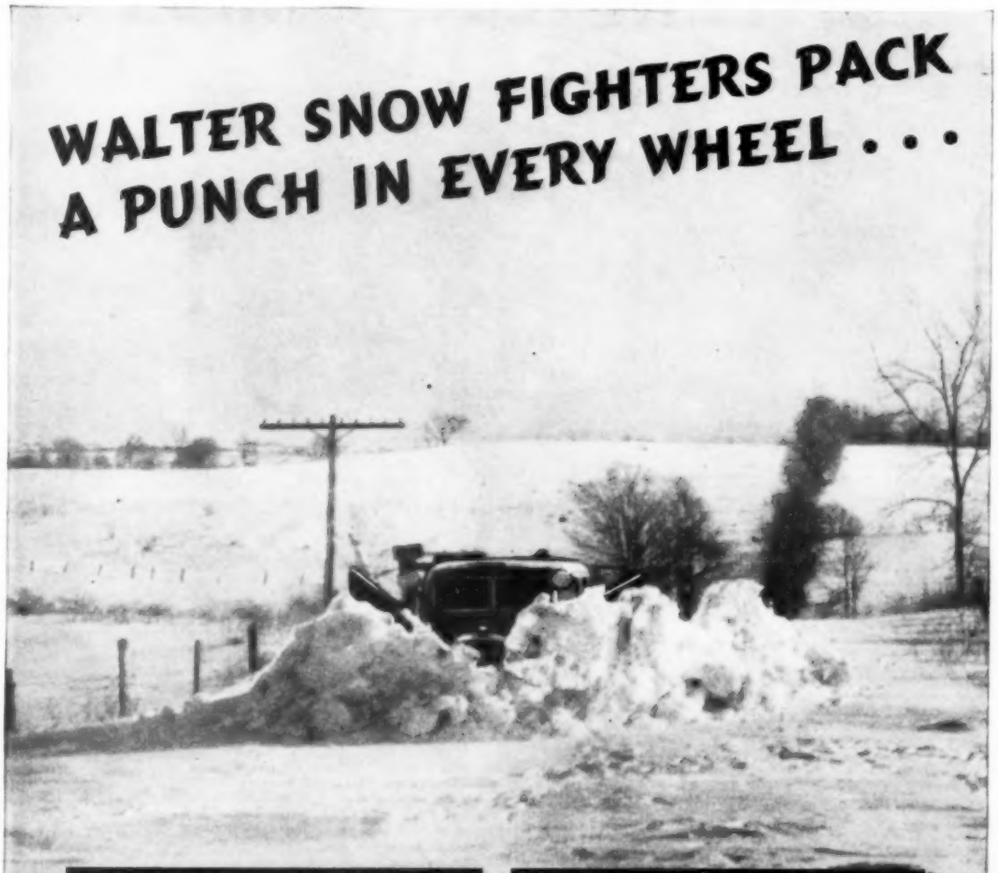
An excellent 23-page report on the present status of this highway and the results by Paul F. Critz, Associate Highway Engineer, U. S. Public Roads Administration, and W. K. Beckham, Maintenance Engineer, South Carolina State Highway Department, appears in Volume 20, No. 2 of *Public Roads* issued by the P.R.A. The conclusions state that the service behavior of the bituminous surfaces was affected more by the character of the base than by the types of surfaces or the materials used in them. The suitability of marl or sand-clay as a base material was not indicated by their apparent similarity to other materials or by their behavior before the bituminous surface was applied. Definite knowledge of the characteristics that affect the service behavior of soil would have made possible the use of local material to the best advantage and would have eliminated the likelihood of importing material that was inferior to that already at hand. The present method of soil analysis and classification provides reliable information on the characteristics of soils and of their probable service behavior under given conditions.

This experimental section has shown that satisfactory bituminous surfaces can be constructed by various methods, but that the materials used must be suited to the method selected. In the design of mixture, consideration must be given to the possibility of the aggregate crushing under traffic, in order that the increase in density will not result in voids being overfilled with bituminous materials. The construction of an adequate base greatly reduces maintenance costs and makes possible the construction of a relatively thin and economical surface. The construction of a thin mat that is satisfactory for current needs is most economical, providing adequate base support is provided originally and such a surface can be strengthened to meet increased traffic demands.

CONCRETE VIBRATORS
(Gas and Electric)
Concrete Surfacing Attachments

Master Vibrator Company, Dayton, Ohio
DISTRIBUTORS IN ALL PRINCIPAL CITIES

WALTER SNOW FIGHTERS PACK A PUNCH IN EVERY WHEEL . . .



That's what we mean by "Walter Four-Point Positive Drive"—the kind you will find only in a WALTER SNOW FIGHTER. The tremendous driving force of four powered wheels, each with live action in it at all times, pushes a Walter through snowdrifts that would smother anything else on wheels.

That is why those communities where winter is winter are ordering more and more Walter Snow Fighters every year. When a blizzard has done its worst, there is only one thing to do—get the roads open as fast as possible. The public will listen to no excuses. A tie-up for a few days, or even for one day, may easily cost a community the price of enough Walter Snow Fighters to keep the roads open for a generation.

The three power-proportioning automatic lock differentials—patented feature of Walter Snow Fighters—divide the power so that the wheels with least traction get the least power and those with most traction get the most power. If one wheel loses traction for an instant on a slippery surface, its mate does not stop, but continues to drive forward with undiminished power.

Now is the time to order your Walter Snow Fighter and make sure that your community will not be snowed in this winter.

Send for literature.

WALTER MOTOR TRUCK CO.
1001-19 IRVING AVENUE, RIDGEWOOD, QUEENS, L. I., N. Y.

The Dependon Safety Shield

New Safety Shield For Eyes and Face

With more than a quarter of a million injuries to workers' eyes reported annually by industry, and with one out of four of these injuries compensable at about double the average cost of accident to arms, legs or torso, eye and face protection has become a problem of considerable importance to safety engineers and employers. One of the latest devices to protect the eyes and face from injury is the Dependon safety shield recently announced by the Sellstrom Mfg. Co., 615-649 No. Aberdeen St., Chicago, Ill.

This device, which might be described as a small bay window, consists of a comfortable adjustable headband to which is fastened the "window" by means of special friction swivel joints which enable the wearer to raise the window above his head, entirely out of the way. This window, which is made of an unbreakable synthetic material and which will withstand heat, sparks and acids, is far enough away from the face to allow for ventilation and for prescribed glasses or goggles.

Further information on the Dependon safety shield, which is recommended for grinding, chipping and similar operations, and for welders, may be secured direct from the manufacturer by mentioning this item or from this magazine.

Two New Engines

Two new air-cooled engines which feature rugged design and interchangeability of parts have just been brought out by the Novo Engine Co., 216 Porter St., Lansing, Mich. These engines, known as Models CA-23 and CA-33, are single-cylinder units with 2¾ x 4-inch and 3¼ x 4-inch bore and stroke, respectively.

Both engines are equipped with large roller and ball bearings, have removable cylinder blocks, large oil and gasoline capacity, speed control and S.A.E. standard mountings for all accessories. An extra-heavy flywheel gives low speed lugging ability and smoothness at all speeds. Special oil feeders feed in all weather at the first turn of the crankshaft.

Copies of Bulletin No. 44, describing these two new engines, may be secured direct from the manufacturer.

Highways of Tomorrow

It has been estimated that by 1950 there will be some 37,000,000 motor vehicles in operation on our streets and highways, compared to about 28,000,000 in 1936. In discussing traffic congestion problems before the Twenty-Fifth Annual Purdue Road School, Robert B. Brooks, Member of the Missouri State Highway Commission, pointed out that a traffic survey in Missouri showed a ratio between urban and suburban mileage of 4 to 1. In other words, 80 per cent of the traffic in Missouri is in the cities. It is estimated that another 10 per cent is in the metropolitan districts contiguous to the cities.

"In my opinion, these highways of tomorrow must be economically justified," Mr. Brooks said, "especially in view of a statement by R. E. Toms, Chief of the Division of Design of the U. S. Bureau of Public Roads (now the Public Roads Administration) that from 95 to 97 per cent of state highway mileage in the United States may never progress in improvement beyond a two-lane highway. Since the building of these arterial highways in metropolitan districts must necessarily be a continuing process, it seems that the principal thing to be considered is, after planning your future needs as remedies, to secure adequate rights-of-way as far in advance of the rise in prices as possible."

New Piling Puller

The new Duff-Norton piling puller, made by the Duff-Norton Mfg. Co., Pittsburgh, Penna., has been especially designed to speed up the pulling or removal of deeply embedded wooden piling or shoring. Used in connection with a lifting jack or crane, this device takes a bite of from 1 to 2½ inches at a time, thus lifting out the pile.

The unit is simple and compact in construction, consisting of but three major parts, all of which are made of tough, durable steel castings. Complete information on the Duff-Norton piling puller is contained in a pamphlet which may be secured by those interested direct from the manufacturer or from this magazine.

The Duff-Norton Piling Puller

'Ramsey'
3-SPEED ALL-STEEL HAND WINCH

2 Sizes

- 5-ton capacity — 135-lb. spools, 325' of ½" cable, $75.
- 3-ton capacity — 75-lb. spools, 150' of ½" cable $55

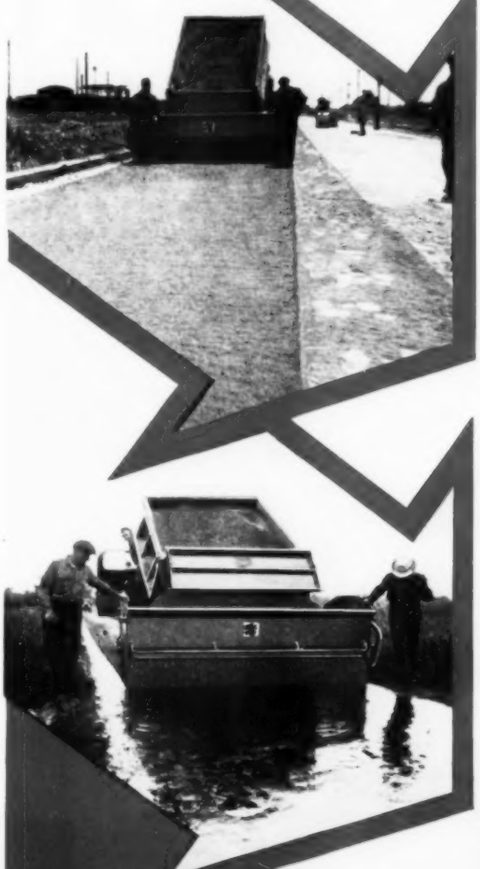
Write for circular and name of nearest dealer

A few territories are open for live distributors

POWER FOR HEAVY LOADS. SPEED FOR LIGHT LOADS. Gear Ratios: 25:1, 4:1, 1:1.

Manufactured by
RAMSEY MACHINERY CO.
1626 N. W. THURMAN STREET, PORTLAND, OREGON

IT'S WHAT IT Does THAT COUNTS



Users buy the Buckeye for what it accomplishes . . . the hundreds and thousands of dollars it saves for the few extra dollars it costs.

This machine cannot be compared to or judged by any other Spreader you have seen or used.

HAVE YOU EVER BEEN ABLE TO . . .

- . . . spread, sand to 1" stone, accurately mile after mile, from a mere sprinkle to 65 pounds per yard?
- . . . spread forward or backward by simply throwing a handy lever?
- . . . keep the spreader level whether attached to large trucks, small trucks, empty or loaded?
- . . . make or break the hitch while the spreader or truck are "in a twist", empty or loaded?
- . . . figure the material required and have it work out as figured?
- . . . get an absolutely uniform job without hand labor?

If not, you have never owned a real Spreader.

Let us send you a list of comments of users about Buckeye Performance.

NEARLY 600 IN USE

No other Spreader has all the features of the Buckeye.

BID THE Buckeye WAY
ask for our operation data before you bid

Mail this to-day

Buckeye Surface Material SPREADER

PATENTED AND MANUFACTURED BY
THE BUCKEYE TRACTION DITCHER COMPANY
SPREADER DIVISION • FINDLAY, OHIO
BUILDERS OF
DITCHERS AND TRENCH EXCAVATORS • BACKFILLERS
HIGHWAY WIDENERS • R B FINEGRADERS • CONVERTIBLE EXCAVATORS

EARTH HANDLING AND ROAD BUILDING EQUIPMENT FOR OVER 40 YEARS

THE BUCKEYE TRACTION DITCHER COMPANY,
Spreader Division, FINDLAY, OHIO

Send at once literature and data on your Surface Material Spreader.

NAME _____
ADDRESS _____
CITY _____ STATE _____

C. & E. M. Photo
The Catch Basins Used at the World's Fair Have Unusually Small Openings, In Deference to the Small Heels on Ladies' Shoes

Maintaining Roads For N. Y. Fair Traffic

(Continued from page 2)

Maintenance of Pavements

It is interesting to note that the work at the Fair was turned over from the Construction Division to the Operation Division gradually, beginning in January, 1939. The schedule called for the complete turning over by May 8 and it was actually completed by May 12.

The contract for the maintenance of the pavements at places indicated by the Operation Division of the New York World's Fair Corp. was awarded to the William P. MacDonald Construction Co. of Flushing, New York, the same contractor who had the paving contract for the Fair. Both the paving and maintenance contracts were based on competitive bids of unit prices per square yard of paving and per ton of materials for binder and surface.

Maintenance by Fair Employees

The maintenance organization of the New York World's Fair devotes its energy to the cleaning of pavements by pick-up sweepers and flushing, with the actual pavement repairs being handled by contract as described above. The maintenance organization resets curbs in the natural "give and take" between the roadway and the landscaping inevitable in such a vast undertaking. Great care has had to be taken in watching the heavy cranes and overloaded trucks on the type of flexible pavement installed throughout the Fair.

One of the maintenance problems involved the care of the drainage system. The catch basins are oil drums connected with the regular storm water drains. Since it was expected that there would be many lady visitors with small tipped high heels visiting the Fair, the bars on the castings over the catch basins were all made extra close to prevent the heels catching. (This seems to have been an unnecessary precaution since most of the feminine visitors have gone to flat-heeled shoes, to avoid "World's Fair feet.") The small openings, of course, necessitated extra watchfulness in cleaning these gratings in time of storm, because they can be quickly clogged with a small amount of paper or other litter. This has been done successfully, there having been practically no cases of flooding during the entire period of the Fair.

The sanitation and maintenance gangs used on the road and their equipment are as follows:

For the 8 a.m. to 4 p.m. shift there are 80 laborers with 10 foremen, four garbage trucks of 10-yards capacity each, two pick-up trucks of 1½ tons each, one 1½-ton rack truck and an Etnyre flusher used on the Interborough Rapid Transit System's parking field. The 4 p.m. to 12 midnight shift is composed of 85 laborers with 10 foremen, four garbage trucks, two pick-up trucks of 1½-ton capacity each and one rack truck of 1½-ton capacity. On the midnight to 8 a.m. shift there are 80 laborers, 8 foremen, two pick-up trucks of 1½-ton capacity each, one rack truck of 1½-ton capacity, thirteen garbage trucks, six Austin-Western power pick-up sweepers, six Etnyre flushers and three 1½-ton trucks for washing and disinfecting garbage cans throughout the Fair grounds.

Personnel

Maintenance operations on the roads at the New York World's Fair are in charge of E. J. Carrillo, Superintendent, with Arthur F. Rogers, Foreman of the Road Gang.

Vibrating Screens Bulletin

A new bulletin describing and illustrating Robins Styles H and J Vibrex screens has just been issued by the Robins Conveying Belt Co., 15 Park Row, New York City. The Style H screen is designed for scalping or accurate sizing, wet or dry, of small or fine material and consists of three elements, the live frame, the vibrator and the supports. The Style J is similar in design and construction, with the same uniform circle-throw motion imparted by a high speed vibrator, and is made in standard sizes of 2 x 4 feet and 2 x 6 feet.

Copies of this new Bulletin 105 may be secured by those interested direct from the manufacturer by mentioning this item, or from this magazine.

LeTourneau Standardizes Wire Rope for All Units

Announcement has been made by R. G. LeTourneau, Inc., that it has adopted Flex-Set preformed Yellow Strand wire rope, made by the Broderick & Bascom Rope Co., St. Louis, Mo., as standard equipment on all its cable-controlled machines, including Carryalls, Rooters, Angledozers and bulldozers.

Flex-Set preformed Yellow Strand wire rope is made of high-quality plow steel, drawn exactly to Broderick & Bascom's specifications. Preforming makes the rope limp and tractable, easy to handle and install, resistant to kinking, and durable.

COMPLETE
WELL POINT SYSTEMS
WILL DRY UP ANY EXCAVATION
Faster—More Economically
Write for Job Estimate and Literature
COMPLETE
MACHINERY & EQUIPMENT CO., Inc.
Dept. C
36-40 11th St., Long Island City, N.Y.
Tel. IRonsides 6-8600

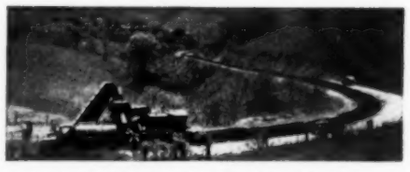
STABILIZING with the

39-9

Barber-Greene Mixer

ECONOMY is the chief reason for stabilization, which means utilizing materials already on the road. This in turn dictates a road mix method. The history of stabilization has proven that there must be complete control—accurate proportioning of the soil and stabilizing agent, thorough mixing, absolutely consistent and controlled treatment. Weather hazards require that the mixing be done in one windrow, in one pass, and this combined with the usual large cross section means a large volume per running foot.

High capacity, accurate proportioning, thorough mixing are simply the fundamentals of the Barber-Greene Travel Plant. That's why it has been identified with the most successful stabilization jobs in the country. It is the answer on all types of stabilization work. It is also the ideal "black top" Mixer, and is equally superior in either Travel or Central Plant Set-Ups.



The Barber-Greene Mixer shown in these two photographs is climbing an 11% grade while mixing 2 yards a minute on a tar stabilization job in West Virginia. On this 9 mile job, the Barber-Greene also did cut-back asphalt and emulsion stabilization. Many more interesting jobs are described and illustrated in our Mixer Booklet. Send for your copy, there is no obligation. Barber-Greene Company, Aurora, Illinois.

BARBER GREENE
AURORA ILLINOIS

Highway Drainage In Orchard Country

Culverts Under RR Fill Solve Flood Problems on Road and Adjacent Land Near San Jose, Calif.

✦ THE California Division of Highways has recently completed a corrective drainage project over a distance of about 10 miles on U.S. Highway 101 south of San Jose. In this area the flat land slopes almost imperceptibly from the southeast to northwest and a railroad embankment paralleling the highway on the low side practically cut off all drainage to the northwest. Heavy rains brought a run-off from the nearby prune, apricot and peach orchards which soon placed from 12 to 24 inches of water over the road.

To correct this condition three things were possible: more drainage through the railroad embankment, drainage to the Coyote River, or raising the road so as to be above these minor floods. Merely raising the grade of the highway would create a greater flooding of the orchards with possible serious damage. To carry off the water to the Coyote River was a seemingly impossible proposition because at right angles to the road the river bed is actually higher than the existing highway grade.

Since the normal flow of water under natural conditions, without interference from man-made obstructions such as the railroad embankment or the highway, would be to the northwest, the first step was to negotiate with the Southern Pacific railroad for additional culvert area beneath their fill. Arrangements were made for one 30-inch and four 18-inch culverts where most needed, with a long level weir at one of the outlets to spread the water as it flowed into the downstream orchards. The cost of this work was borne by the State.

The next step was to take care of the additional water on the upstream side of the highway. Drainage surveys showed that by running drainage lines diagonally through the orchards for distances as great as 2,300 feet water from the drainage ditches along the road could be disposed of satisfactorily in the Coyote River. Three of these drains of 18-inch concrete pipe were constructed with great care not to injure the roots of the fruit trees as the lines were laid between the rows.

The last step was the actual raising of the grade of the highway at various sags about 3 feet for a distance aggregating about one mile so that additional culvert pipes could be laid beneath the roadway to carry water to the downstream side.

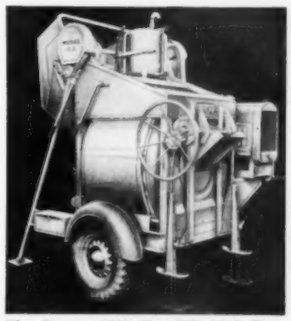
This work was done during the summer of 1938 under the direction of E. G. Poss, Construction Engineer, Division IV, San Francisco. Inspections of the work during early spring rains in 1939 showed the system to be working excellently and with no flooding of the highway.

Features of 1940 Concrete Mixers

An automotive-type transmission is one of the features of the 1940 line of Speedline concrete mixers just announced by the Jaeger Machine Co., 701 Dublin Ave., Columbus, Ohio. This new transmission consists of machined heat-treated alloy steel gears and heavy-duty ball bearings, fully enclosed from dirt and weather and running in oil. This improved transmission, which is claimed to increase power efficiency by 30 to 40 per cent, increase mixer life and eliminate many mechanical noises, is standard on all sizes from the 5-S up.

The shaft load is divided. One set of gears drives the drum through a short chain to the ball-bearing drum pinion shaft and a separate set of gears provides right-angle drive through a chain to the ball-bearing skip hoist shaft overhead. Semi-steel is used in all sprockets and the one-piece drum gear.

The aim of the design of the 1940 Speedlines is to combine heavy-duty service with the advantages of light, portable, end-discharge trailer design. This construction is the same in all sizes from 5-S to 14-S. The drums are equipped with machined high-carbon steel tracks, and are carried on chilled ground-face car-wheel rollers. Pneumatic tires, Timken-bearing wheels and spring shock absorbers are furnished for high-speed trailing and easier maneuvering. Two or four-wheel mountings are interchangeable, with improved adjustable supports to take the load off the tires while the mixers are working. The weight of the loading end is supported from the top frame by means of two full-length supports, adjustable to varying ground levels.



The Jaeger 1940 Non-Tilt 10-S Concrete Mixer

Copies of Catalog NT40, describing these new concrete mixer models and an improved end-discharge 3½-S size equipped with a measuring batch hopper, may be secured direct from the manufacturer or from CONTRACTORS AND ENGINEERS MONTHLY.

PILE HAMMERS and EXTRACTORS
HOISTS–DERRICKS WHIRLERS
•
Special Equipment
Movable Bridge Machinery
•
Write for descriptive catalogs.
McKIERNAN-TERRY CORP.
19 Park Row, New York
Distributors in Principal Cities

new 604

A NEW SHOVEL BY KOEHRING . . . new design, modern construction with many features for lower operating and maintenance costs . . . increased yardage . . . more operating ease. Enclosed gears running in oil, anti-friction bearings, forced-feed lubrication, welded construction, less weight, greater strength, high speed are a few of the important reasons why the new Koehring 604 is a profitable investment. A new catalog, giving complete description of this new Koehring Shovel, illustrates the outstanding progress made in shovel design. Write for it today.

KOEHRING CO.
MILWAUKEE • WISCONSIN

The New P & H Backfiller

New Backfiller Is Easily Converted

A new backfiller with many advantages over previous models, including a 57 per cent increase in power, greater ease of operation and greater adaptability for a wider range of services, has recently been announced by the Harnischfeger Corp., 4419 W. National Ave., Milwaukee, Wis. In addition to backfilling, this machine can be used for lifting, pulling, pushing, handling pipes and similar material, and drum hoist applications.

The machine is equipped with a live telescopic boom of latticed construction, with a swinging radius of 180 degrees and adjustable between 22 and 31 feet in increments of 18 inches. With its 55-hp gasoline engine, it has sufficient power to handle scrapers up to 7 feet in width. The unit is easily maneuverable for pipe handling and similar jobs, and its easy convertibility to other services makes it possible to keep it busy on construction jobs.

One-Point Attachment For Big Snow Plows

A new feature of the Wisconsin Special 1940 snow plow models for the larger sizes of motor trucks is the single point attachment, on which the patents are pending. This feature does away with removing or inserting a number of pins and unhooking of chains in order to remove the plow proper from push bars and hoisting mechanism.

The single point attachment consists of a new design embodying a large pivot trunnion placed at the center of a sliding plate, which in turn is attached to the hoist angles and push bars which are mounted on the truck chassis. To hook up the plow proper with the pivot trunnion all that is required is to drive the truck up into the plow until the pivot trunnion passes through a hole in the plate attached to the plow, drop a large king pin, and the outfit is ready to plow snow. To unhook the plow, the operation is simply reversed.

This single point attachment not only permits an easy hook up but also provides a feature permitting the plow to rotate sideways on the pivot trunnion in order to follow any road contours, thus relieving strain on the truck frame. In addition, the plow is hinged and the nose can be made to dig by turning an adjusting screw located on top of the plow bulkhead.

The 1940 catalog on the complete line of Wisconsin snow plows, including V-type, one-way rigid-blade and reversible trip blade models, has just been issued by the Otto Biefeld Co., Watertown, Wis., from which company copies may be secured by interested state and county highway engineers on request.

Complete Information On Secondary Crushing

"The Facts You Want About Secondary Crushing" is the title of a new bulletin recently issued by the Pioneer Engineering Works, Inc., Minneapolis, Minn., which claims to clarify certain misunderstandings about secondary or fine reduction crushing. It contains a general discussion of the many different types, sizes and kinds of crushers available, information on the problem of selecting the correct size of roll crusher for your particular requirements, and detailed descriptions and illustrations of the line of Pioneer crushers. Copies of this instructive bulletin may be obtained by those interested direct from the manufacturer.

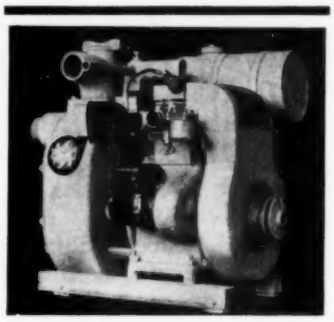
Denn Burgess Promoted

Announcement has been made of the election of Denn M. Burgess, for the past year General Manager of R. G. LeTourneau, Inc., Peoria, Ill., to the position of Vice President as well. With the company since 1933, Mr. Burgess has advanced steadily from district representative to eastern sales manager, sales manager, and last autumn to general manager.

In connection with his new duties, Mr. Burgess sailed in August for a survey of the export field in France and England.

New First-Aid Catalog

A new complete handbook of first-aid supplies, including first-aid kits, dressings, treatments and supplies packed in carton units, splints, stretchers, and other items required in first-aid work, has been issued by the Davis Emergency Equipment Co., 55 Van Dam St., New York City. Copies may be secured direct from the manufacturer.



2" Light-Weight
High-capacity, Self-priming Pump

Total weight 97 pounds, including 2-hp. air-cooled engine. Guaranteed self-priming up to 25'. Total head 50'. 8,000 g.p.h.
Ask for Bulletin 22-W

Made by
MARLOW PUMPS
Ridgewood New Jersey

Do you wish a really superior dumping unit for handling 2-cu. yd. Detachable Buckets?
SEE OUR MODEL LF
(Load Forward)
DEMPSTER DUMPSTER
For any 1½-ton truck
NO COUNTERWEIGHT OVERHANG SIDESWAY
All the load on the chassis
DEMPSTER BROS. INC. Knoxville, Tenn.

FILLING IN A BAY TO GIVE SKYLINERS ELBOW ROOM

MORE THAN PLEASED
—was the sentiment of Mr. Ben Wells, General Superintendent, with the work done by the Gardner-Denver UMB Wagon Drill, and WBG Diesel-driven portable air compressors. And that's what you'll say, too, when you put Gardner-Denver equipment on the job . . . for they'll give you thousands of hours of perfect service . . . save you money in low-cost operation and low maintenance. You'll agree that they're the best equipment for big jobs, tough jobs—every job!

PERFORMANCE LIKE THIS SHOWS YOU WHY IT PAYS TO CHOOSE GARDNER-DENVER EQUIPMENT

When airports spread out, something often moves aside. This time it's San Francisco Bay. In order to enlarge the San Francisco Airport, the bay adjoining is being rapidly filled in with 600,000 yards of material.

The Macco Construction Company, handling the job, called on a Gardner-Denver UMB Universal Mounting Wagon Drill and two WBG-315' Diesel-driven portable air compressors to keep up the quota of 4500 yards of fill per day.

A record footage run of 525 lineal feet in eight hours, averaging approximately 430 feet per eight-hour shift—that was what the UMB Wagon Drill accomplished. Working one eight-hour shift per day, it kept a 2½ yard shovel busy eighteen hours a day, loading a fleet of twelve 16-yard trucks which traveled continuously from the quarry to the airport. Get complete facts and operating data about these UMB Wagon Drills and Portable Air Compressors. Write us today for full information. Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER 80th ANNIVERSARY YEAR

Interesting Methods Used For Spandrel Arch Bridge

(Continued from page 7)

soon as rock was encountered the contractor carried a trench down around the outside of the excavation at all times with a low corner for the pump sump. Most of the water came from the gravel instead of from the contact plane of the rock and gravel. A cofferdam of 2 x 6 studs sheeted both sides with ¾-inch lumber and filled with 1 to 4 concrete grout was carried down within the area surrounded by the trench as a protection against water in the excavation itself. The excavation was carried to the neat line, below the elevation of the cofferdam which sealed out the water above. The footings were carried 4 feet into rock. Drilling equipment consisted of a 220-foot Gardner-Denver compressor and a Gardner-Denver 85 breaker and Thor 70 hammer. The small amount of seepage water was dried up with a 3-inch Thor pneumatic pump. The holes were shot with du Pont Gelex No. 2 using a cap and fuse but with a few electric shots. The actual rock excavation was about 30 x 14 feet to neat line and the coffer mentioned was kept tight with sawdust and sand for plugging leaks that occurred during construction.

Without forms the concrete was poured 30 x 14 feet for the footings against the rock face. The shafts measure 7½ feet thick x 27 feet wide and 27 feet high. The thickness is reduced to 5 feet at the spring line of the ribs. Above the spring line the single shaft divides into two shafts 7½ feet wide and 16½ feet high.

Form Work

The pier or shaft forms were made in panels 20 feet high x 15 feet wide and used three times. They were lined with ¼-inch plywood against the 1-inch form lumber with 2 x 6 studs and double 2 x 4 wales. The studs were placed on 16-inch centers and the wales 30 inches apart. Speedee form ties and spreaders were used throughout. These consist of a ¾-inch channel with two notches as planes of weakness so that the channels can be broken as desired for the removal of the forms, and a slot outside the forms with a wedge to lock the forms. One of the notches is for breaking the channel outside the forms and the other for the break inside. A pressed-out section forms a lip inside the form for a spacer. For placing the channels in the forms a round hole was bored in the form and then after the insertion of the spacer the opening was plugged with a half-round wedge.

For the arched ribs the forms were held by self-supporting trusses resting on capped piling bents supported on the footings at the ends. A framed bent on 4 x 8-inch mud sills at the center was used for erection purposes only. The pairs of trusses for each span formed three-hinged arches. The end pins were connected by 1¼-inch tie rods which were used only for moving the pin shoe during erection and not to carry a load at any other time. The trusses were built up of 2½ x 2½ angles as diagonals and at the top two 5 x 3 angles back to back and at the bottom a pair of 2½ x 3 angles back to back. The pin connection at the top and ends was a 3-inch pin which was taken out when the trusses were removed and carried to the next arch to be poured. This type of centering was chosen because of the flashy character of the stream which might have caused even pile centering to be badly damaged during pouring. An analysis of the costs showed that the method chosen was economical, both of materials and labor, compared with the more usual methods which might have been selected.

Over the trusses 10 feet long, 6 x 6 cross beams were used on 20-inch centers to brace the structure and also to carry a cat walk for placing the concrete and for rubbing. The forms were made of 1 x 8's curved to fit the arch and lined with ¼-inch Douglas Fir plywood. When it came time for rubbing the faces of the arches the contractor used simple and safe hangers made of pairs of 2 x 6's spaced 10 feet 9 inches on centers and with two elevations

(Concluded on page 27)

C. & E. M. Photo

The South End of the Onion Creek Bridge Near Austin, Texas, Showing the Wood Centering in Place for One of the Approach Spans and Two Short Spans Completed

Concrete VIBRATORS
AND GRINDERS
Write for Circular on types, sizes and prices
White Mfg. Co.
ELKHART INDIANA

THE MIDDLEWEIGHT CHAMPION

Is a ½-Ton Truck Too Small?

Is a 1½-Ton Truck TOO BIG?

Then Use the INTERNATIONAL ¾ to 1-Ton Model D-15

A ½-ton truck is too small for many needs, and often a 1½-ton truck is too large. There is a great need for a truck to meet the *middleweight* requirements.

International has built a ¾ to 1-ton truck to fit the job exactly—the "In-Between" International Model D-15. But International engineers didn't just build up a ½-ton model to bridge the gap—that isn't the way International does things. The D-15 was designed and built especially for ¾ to 1-ton loads. And like all Internationals, it's an "all-truck" truck made to do a truck's job with typical International economy.

If you have middleweight loads to haul, put this ¾ to 1-ton International on your job and cut the needless expense of using a truck that's too big, or one that's too small.

Many thousands of this ¾ to 1-ton truck are on the job today. Dealers and branches operating under this famous Triple-Diamond emblem will show and demonstrate the "in-between" D-15 *at your convenience.* Other International sizes, Half-Ton to big Six-Wheelers.

INTERNATIONAL HARVESTER COMPANY
(INCORPORATED)
180 North Michigan Avenue Chicago, Illinois

The "In-Between" International Model D-15

Designed for saving time, gas, oil, and wear and tear—in traffic, in parking, in alleys. Fast getaway and pickup—fast in all speeds. Wheelbase 130 inches; inside body 102 inches long.

Graceful lines in safety steel—a modern cab interior—superb springing and shock-absorbing—low center of gravity—low over-all height with AMPLE load space—extra-maneuverable—STAMINA and ECONOMY morning, noon, and night.

INTERNATIONAL TRUCKS

Railroad and Highway Relocation at Shasta

(*Continued from page 2*)

Bridge plus two underpasses was awarded to Clifford A. Dunn on a bid of $347,779.50, while the superstructure and steel erection of the two bridges will be handled by the Bethlehem Steel Corp., which bid $294,365.00.

The next section of work, including railroad grading plus 2.5 miles of parallel highway grading, was awarded to Granfield, Farrar & Carlin on its bid of $296,899.70.

On the Delta section, there are two bridges (the third and fourth crossings of the Sacramento River) and Tunnels 11 and 12, totaling about one mile. The substructures of the bridges and the tunnels will be constructed by the United Concrete Pipe Corp. of Los Angeles, which bid $598,673.50, while the contract for the superstructures of the two bridges went to the American Bridge Co. on its bid of $124,337.00.

By-Pass Tunnel

The present railroad track, carrying main line traffic between California and the Pacific Northwest, passes over the site of the right abutment of the dam. So that construction work on the dam would not be held up prior to the completion of the high-line relocation, it was necessary to provide a railroad by-pass. This took the form of a tunnel 1,820 feet long under the west abutment and at a lateral distance of 725 feet from the river. It is horseshoe shaped in cross-section, 28 feet high and 26 feet wide, completely lined with concrete 18 to 21 inches thick. Including tunnel and approaches at either end, 85,000 cubic yards of excavation was necessary.

The tunnel contract was let to the Colonial Construction Co., and they holed through March 4, 1939, completing the tunnel, ready for the rails, on June 15. The first train passed through on June 26.

When the high-line railroad is completed and opened to traffic and the old line abandoned, the by-pass tunnel will be available for river diversion while concrete is being raised in the dam. When it has outlived its usefulness as a carrier of trains and water, it will be plugged by a section of concrete 162 feet thick and its final disposition left to the judgment of the ages.

Diesel Electric Generating Sets

A complete line of standardized diesel electric generating sets was recently announced by The Buda Co., Harvey, Ill. These standard sets were designed after years of experience in the field with what might be termed "tailor-made" plants, according to the manufacturer, and the equipment is of the latest design, proved in actual service. The entire unit consists of an engine, generator and radiator, where required, mounted on a heavy structural steel base provided with spring vibration dampers so that these units may be installed in any location without fear of vibration. The units are available with all necessary auxiliary equipment, such as silencers, generator panels, etc., or without the extra equipment.

The engines are designed with Lanova head and are amply proportioned and conservatively rated for continuous trouble-free service, the manufacturer states. The generators are also designed for long trouble-free life. All sets are thoroughly tested before leaving the plant and are shipped ready for operation. Installation is simple with the new type of base as it is necessary to provide only a good floor on which the unit is installed. The largest units required only twenty hold-down bolts.

These new standard sets, which are available in a wide size range from 5 to 75 kw, alternating and direct current, are described and illustrated in a new bulletin, No. 963, copies of which may be secured direct from the manufacturer.

Use of Dynamite In Frozen Ground

In answer to the frequent question "Can dynamite be used in frozen ground?" the Institute of Makers of Explosives point to the experience of the engineers who constructed the airport at Juneau, Alaska, where 50,000 cubic yards of frozen gravel was dynamited to make a 3,000-foot runway.

According to *The Explosives Engineer*, whenever it is necessary to complete an excavation in cold weather, the ground can be blasted if it is frozen deeply enough to make the use of hand picks or digging machinery an uphill struggle. If a contractor must dig during the winter months, dynamite will save labor and aching backs. Even drainage ditches have been blasted, a short stretch at a time, during very cold weather. Another common winter use of dynamite is blasting frosted gravel piles to resurface by-roads which become muddy in the spring.

One important rule must always be followed when blasting frozen ground. The dynamite charges must be loaded within the frosted area, and never below it. If the charges are loaded below the frosted layer, and exploded in unfrozen ground, the explosive force will be largely scattered in the yielding, unfrozen portion. In this case, the frozen layer will be cracked and buckled, but will still be unworkable. Care should be taken to load the charges in holes drilled to within a few inches of the bottom of the frozen layer. This will confine the power of the explosive within the frozen area, most of which will be thoroughly broken up.

In blasting heavy ground frozen 2 or 3 feet deep, one-half pound stick of dynamite is usually used for each foot of the frozen depth. These charges are loaded in holes spaced about 4 feet apart, and the force of their explosion should break up frozen clay or gravel soils sufficiently to make hand digging possible. For machine digging, these loads may be cut in half.

In light soils, only three-quarters of a stick of dynamite is necessary per foot of frozen depth and these charges can be cut in half for machine digging. Gravel and sand piles frequently become frost encrusted to a depth of 3 or 4 feet. Pound charges of dynamite placed in holes 6 feet apart will generally effect a very good breakage in the frosted surface.

Spreader-Finishing Machine

The D-K spreader and finishing machine, made by the Shunk Mfg. Co., Bucyrus, Ohio, lays any type of mix, hot or cold, any thickness desired, and levels without forms. It has a capacity of 1,000 to 1,200 tons per day and a width variation of from 6 to 10 feet. The rear drive or tread of the D-K runs on the newly laid surface, which eliminates the possibility of reproducing any old depressions, ruts or holes, according to the manufacturer.

Construction details and specifications are contained in an illustrated folder which those interested may obtain from the manufacturer. Address Dept. F.

IF YOU WRITE SPECIFICATIONS FOR GUARD RAIL

Here's a ready-made item that will save

10 to 15 per cent

It will pay you to include the above dimensions in your specifications of guard-rail anchor rods. This is the standard rod, as recommended by the Committee on Safe Highways, Report of Problem Committee on Guard Rail. Bethlehem regularly carries this standard item in stock, priced from 10 to 15 per cent lower than specially-made rods of the same strength.

This anchor rod meets the 50,000-pound strength requirement of most state specifications. It is heavily galvanized. Ample take-up is provided in the turnbuckle. All necessary washers are included.

In some states, a preference has been shown for an "A" dimension of one foot and a "B" dimension of 15 inches. Threads are such, on Bethlehem rods, that simply by turning the upper rod around it meets either this specification or the one shown above.

Bethlehem carries at least 1000 of these standard (CG-158) anchor rods in stock at all times. This is part of our regular stock of all parts for complete cable guard-rail installations. Other anchor rods can be made on short notice—but, because you will save money and receive immediate delivery, we recommend that you specify the standard anchor rod whenever possible.

BETHLEHEM STEEL COMPANY

Shasta Dam

(Continued from page 2)

which is all that it will be able to take care of. But Shasta Dam, by conserving the flow of the Sacramento, will be able to handle the situation in the central and northern part.

Down from Shasta Dam will come a 200-mile transmission line to a substation at Antioch. Power from there will supply pumping plants for the San Joaquin pumping system, lifting water from the Delta up as far as Mendota. This power will also lift 350 second-feet of water into the Contra Costa canal, which is 46 miles long, delivering fresh water for industrial use along Suison Bay as well as for agricultural, domestic and municipal use.

Shasta the Key Unit

As the key unit of the Central Valley Project, Shasta Dam presents construction features of unusual interest, some of them record breaking. It will be a gravity-type concrete dam 560 feet high from the lowest foundation and 580 feet thick at the base. Built on a slightly curved axis, it will be approximately 3,500 feet long at the crest, which will carry a roadway.

The dam structure, together with the 7-story power house where 375,000 kw of electrical energy will be developed. will contain 5,600,000 cubic yards of concrete. All classes of excavation will reach 3,215,000 cubic yards. There will be 250,000 cubic yards of earth fill in embankment and 1,087,500 cubic yards of rock fill. The overflow spillway in the center, 375 feet wide and with a drop of 480 feet, will constitute the highest man-made waterfall in existence and will be about three times the height of Niagara.

Above the dam, in the canyons of the Sacramento, Pit and McCloud Rivers, will be created a reservoir having 4,500,000 acre-feet of storage capacity in a distance of approximately 35 miles from the dam.

An interesting comparison of Shasta Dam with those of other large conservation projects is given in the table on page 2, while the table below indicates the tremendous tonnage of materials involved in the Shasta and Friant Dams, from the U.S. Bureau of Reclamation estimates.

FREIGHT WEIGHTS OF CENTRAL VALLEY PROJECT CONSTRUCTION MATERIALS

(Estimated in tons)

Materials	Shasta Dam (including R.R. Reconstruction)	Friant Dam
Cement	1,250,000	320,000
Aggregates	10,400,000	3,222,000
Lumber	125,000	19,500
Reinforced steel	22,500	1,650
Steel gates and machinery	11,750	6,050
Steel rails and accessories	81,000	——
Electrical machinery	7,050	——
Steel conduits and pipes	14,900	4,400
Contractor's plant and machinery	25,000	6,000
Fuel, coal and lubricants	150,000	28,000
Hardware and tools	25,000	6,400
Explosives	1,250	250
Miscellaneous, food and merchandise	40,000	10,000
TOTALS	12,152,550	3,624,250

As usual, the Bureau of Reclamation is furnishing all the materials for the dam itself, the contractor furnishing the labor and equipment. The contract for the construction of the dam was awarded in July, 1938, to the Pacific Constructors, Inc. The amount of the contract was $35,939,000. The contractors were required to post a guarantee bond with the bid of $2,000,000, a performance bond of $5,000,000 and a labor and materials payment bond of $2,500,000. The resulting total of $9,500,000 is the largest construction bond requirement on record.

Personnel

The Pacific Constructors, Inc. is made up of twelve nationally known contracting firms representing almost every section of the country. They are: The Arundel Corp., Baltimore, Md.; Foley Bros., Inc., New York City; L. T. Lawler, J. C. Maguire & Co., Butte, Mont.; W. E. Callahan Const. Co. & Gunther-Shirley Co., Los Angeles, Calif.; Shofner, Gordon & Hinman, Denver, Colo.; A. Guthrie & Co., St. Paul, Minn.; Hunkin-Conkey Construction Co., Cleveland, O.; Griffith Co., Metropolitan Construction Co., American Concrete & Steel Pipe Co., D. W. Thurston and L. E. Dixon Co., all of Los Angeles, Calif. The president of the Pacific Constructors, Inc. is William A. Johnson of Los Angeles, while at the field office, the address of which is Shasta Dam, Calif., Frank T. Crowe is General Superintendent and B. W. Goodenough, Engineer.

For the Bureau of Reclamation, Walker R. Young is Supervising Engineer of the Central Valley Project, with offices at Sacramento, Calif. The field office is located at Toyon, Calif., where Ralph Lowry is Construction Engineer, with Roy M. Snell, Field Engineer on railroad relocation, Grant Bloodgood, Field Engineer on the dam and Charles G. Anderson, Office Engineer.

New Wire Rope Catalog

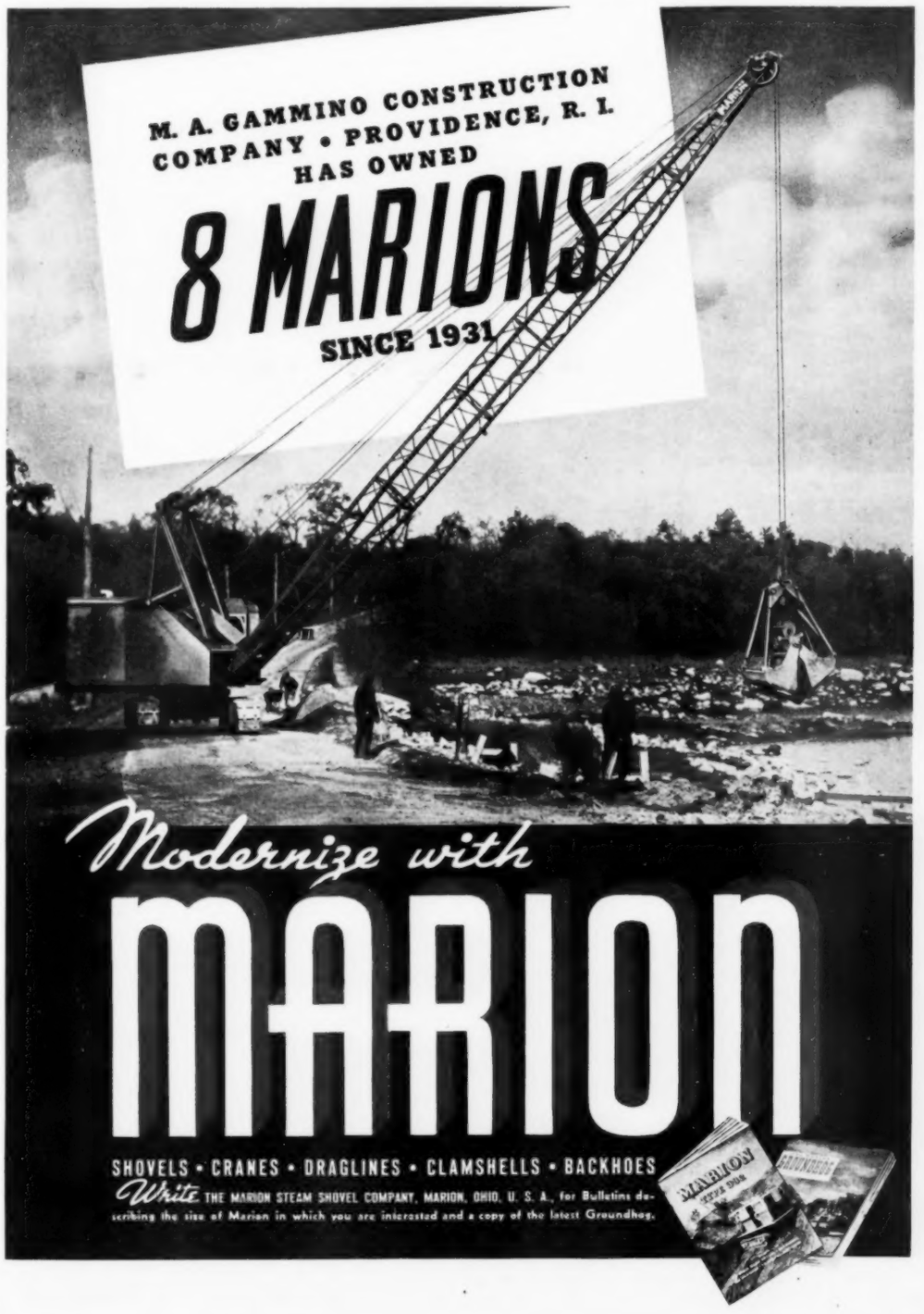
The publication of a new catalog on wire rope has recently been announced by the Hazard Wire Rope Division, American Chain & Cable Co., Wilkes Barre, Penna. This new catalog is virtually a pocket-sized handbook on wire rope, containing information of a practical and technical nature as well as prices and specifications of the various constructions of wire rope made by that company.

Copies of this Catalog No. 20 may be secured by interested contractors and engineers direct from the company or from this magazine.

New Air-Cooled Engine

A new addition to its line of heavy-duty air-cooled engines has recently been made by the Wisconsin Motor Corp., Milwaukee, Wis. This new single-cylinder 4-cycle engine has a 2⅞-inch bore by 2¾-inch stroke, with a piston displacement of 17.8 cubic inches and a peak horsepower of 4.2 at 2,400 rpm. Containing all the regular features of Wisconsin air-cooled engines, the new Model AK has been especially designed for light weight and low cost.

Literature describing this new engine may be secured by interested contractors and engineers direct from the manufacturer by mentioning this item.


M. A. GAMMINO CONSTRUCTION COMPANY • PROVIDENCE, R. I.
HAS OWNED
8 MARIONS
SINCE 1931
Modernize with
MARION
SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES
Write THE MARION STEAM SHOVEL COMPANY, MARION, OHIO, U. S. A., for Bulletins describing the size of Marion in which you are interested and a copy of the latest Groundhog.

SAND'S-STEVENS
Line & Surface LEVEL

Endorsed and Adopted by Road Builders and Contractors

Level is easily and quickly attached to line. Special feature construction prevents accidental detachment from line. Construction is sturdy, and accuracy guaranteed.

SAND'S LEVEL & TOOL CO.
8531 Gratiot Ave. Detroit, Mich.

PICKS and SHOVELS

By O. E. POTTER

New Type of Parking Ticket Protects Seeded Roadsides

On his recent jaunt through the midwest to secure interesting articles in the field for future issues of CONTRACTORS AND ENGINEERS MONTHLY, the Editor got a parking ticket. You may say "So what? It happens to the best of us." But we believe that there is news in it because it was a new type of parking ticket.

On his visit to a road job in Minnesota, the Editor parked his car beside some other cars belonging to the men on the job, then went about his business of securing the necessary data and photographs of the work in progress, and when all this was completed, returned to his car where the contractor, Joseph D. Bonness, handed him the parking ticket reproduced here. It was done with a smile, and even our chagrined Editor admits the merit and need for such a system of checking up.

Keep Your Car Off Seeded Slopes

We are responsible for all seeded slopes on the job and must repair all damaged areas. We must insist that cars be parked either at cross roads or in farm yards.

PARKING OR DRIVING OF EMPLOYEES CARS ON SEEDED AREAS WILL BE CAUSE FOR DISCHARGE

JOS. D. BONNESS, INC.

There seems to be a growing tendency to do the seeding and sodding along the roadsides of a highway project earlier in the course of the work, instead of leaving it until the end of the job. This means that the newly seeded and sodded shoulders must be protected, if the work isn't going to have to be done all over again.

The Editor explains, by way of an alibi, that he thought he was parking in a permissible spot, in view of the fact that he parked alongside other cars. But closer observation revealed that the other cars were parked in a farm driveway and the Editor, alas, was on the grassed shoulder slope. However, it pleased him greatly to see the care being taken by Mr. Bonness of the roadsides along his project, and we pass the story along as another indication of the increased interest in roadside development on the part of contractors.

To the Barricades!

Embattled housewives built a barricade of bricks, railroad ties and household equipment across a dusty mid-western small-town street recently. They even threatened, according to report, to toss flatirons at the street workers unless something was done about allaying the dust.

And in Nuremberg, Penna., according to a report from the A.R.B.A., housewives staged a similar protest against dusty conditions which, they said, made housecleaning futile and did all sorts of unpleasant things to the Monday wash. They claimed that the abandonment of a paving job left the road in such shape that passing cars sent clouds of dust into their homes. Standing shoulder to shoulder across the secondary highway through the town, they defied efforts of state police to reopen the route to traffic, and drivers were forced to detour over other routes.

Don't let anyone tell you that the general public isn't interested in the efforts of engineers and highway contractors to give them smooth, safe, dustless thoroughfares.

Highway Construction Work Increased Throughout Brazil

Increased interest and activity in highway construction throughout Brazil has been apparent during the latter part of 1938, according to a report received from the U. S. Bureau of Foreign and Domestic Commerce. The Brazilian Government has announced that the Ministry of Transportation has formulated a 5-year plan for the extension and improvement of communications, including highways, and additional state road taxes on motor fuels were established during the year to finance highway maintenance and extension. Around 1,000 men are employed at present in building roads in the interior of the State of Bahia, where the Cocoa Institute has been giving considerable assistance to highway development. These highways are mostly of dirt construction designed to place inaccessible cocoa-producing interior regions in communication with market centers.

Recently the President of Brazil signed a degree-law authorizing the State of Sao Paulo to float an internal loan of $6,600,000 with 7 per cent interest, and to be amortized in 15 years for the "construction, maintenance and improvement" of highways in that State. This is the most substantial specific amount made available for highway purposes by any Brazilian State in recent years. The 1939 highway budget for Rio Grande do Sul is $1,155,000 to be used on construction, repair and maintenance of 3, 293 miles of highways in that state.

Many other states, particularly Minas Geraes, Rio de Janeiro, Parana, and Santa Catharina, as well as the northeast section of the country where the Federal Drought Relief Commission is carrying out various projects, are also active in highway construction.

Contractors Like It!

The Flex-Plane Wide Screed Finishing Machine readily handles dry concrete. Under one inch slump, the Flex-Plane vibrated screed does the trick. Four speeds plus three speeds for screed. Ask for more detail.

FLEXIBLE ROAD JOINT MACHINE CO.
WARREN, OHIO

"Wonder ef'n she needs high compression?"

NOTHING SHORT of a miracle could put real power and performance into the mountain boys' venerable jalopy. And high compression is no miracle. It is an accepted principle of increasing engine power and improving fuel economy, used today by all truck and bus manufacturers in current engine models.

The results of high compression in the engine are: Increased power from the same amount of fuel, lower cooling water and exhaust gas temperatures and decreased average bearing pressures at high speeds, under which condition bearing punishment is greatest. The results of high compression on the road are: The ability to haul heavier payloads, the maintenance of faster, more uniform schedules and decreased fuel consumption, or any combination of these.

Both "high" and "low" compression are relative terms and depend on the anti-knock value of the gasoline generally available at the time the terms are used. Twelve years ago a typical engine had a compression ratio of 3.6 to 1. Today the average truck engine has 5.5 to 1. The difference is explained by the steadily increasing anti-knock value of gasoline, which has permitted corresponding increases in compression ratio.

When you buy better grades of gasoline from a reputable oil refiner or marketer, you'll find other advantages besides high anti-knock value—low gum content, balanced volatility and the correct vapor pressure to prevent vapor lock.

Ethyl Gasoline Corporation, Chrysler Building, New York, N. Y., manufacturers of anti-knock fluids (containing tetraethyl lead) used by oil companies to improve gasoline.

4 RULES FOR GOOD GASOLINE

VOLATILITY should be balanced, for full power and best economy.

VAPOR PRESSURE should be adjusted to meet operating conditions.

GUM CONTENT should not exceed ¼ of a gram (4 small drops) per gallon.

ANTI-KNOCK VALUE should be high, at least 68 octane number.

THE BETTER THE GASOLINE THE BETTER THE PERFORMANCE

"Cooperation Both Ways" Motto of County Engineer

Lloyd Quarve, in Fairbault County, Minn., Has Built Up System of County-Aid Roads, Part Now in County System

✦ IF the system of Federal-Aid roads and the state-aid roads works, why not a similar system of county-aid secondary roads in the townships? That question was in the mind of Lloyd Quarve, County Engineer of Faribault County, Minn., over 15 years ago and he started to put it to work. Through cooperation with the Town Boards, county-aid roads were established and the County spent $1,500 a year on these roads in a single township, provided the money was matched 50-50 by the township. When the state gas tax money became available in 1930, Faribault County took over some 250 miles of these secondary system roads into the county system as gas tax roads.

Organization

Faribault County, the seat of which is at Blue Earth, Minn., has five commissioner districts which elect commissioners, three at one time and two at another, at the biennial elections, for 4-year terms. These commissioners, whose duties are to set the policy of the County Highway Department, appoint the County Engineer for a term of two years. The present County Engineer, Lloyd Quarve, has occupied the position with the confidence of the Board and the people for 18 years.

The new commissioners are elected and come into office in January and then do not appoint the County Engineer until the following May. This is prescribed by state law and is very good because it gives the new commissioners time to closely observe the work of the engineer before the time comes for an appointment. The state law now permits an initial appointment of a new engineer for a period of one year, followed by two years for reappointments. The County Engineer is responsible for the hiring and firing of all employees of the County Highway Department.

Financing the County Highways

The money for carrying on the work of constructing and maintaining the highways in Faribault County comes from several sources. First there is the Dunn 1-mill road tax levied by the counties and turned over to the state and distributed so that no county receives more than 3 per cent of the total and no county receives less than ¾ of 1 per cent. The distribution is for work actually done by the counties and approved by the State Highway Department. Of the 87 counties in the state about 84 get more money from this levy than they pay into the fund.

Next there is the direct levy by the county board of supervisors, and then the state gas tax, one third of which is returned to the counties. The vehicle license fees are retained by the state. The distribution of the money from the gas tax is in the same manner as the Dunn levy except that no county receives less than 1 per cent of the fund. The Board of Allotment of this money consists of the Commissioner of Highways, the State Treasurer, and the State Auditor. The allotment is made on the basis of traffic needs, mileage and area.

From the gas tax money the county is not allowed to expend less than 20 per cent nor more than 50 per cent on maintenance, while from the state aid, or Dunn levy, not less than 40 per cent must be spent on maintenance, with no top limit.

In 1938, the last year for which a full report is available, the Dunn 1-mill tax brought $13,191 to the county; the county real estate levy was $95,000; the gas tax returns were $70,286; and in addition there were made available to the county for construction in 1939 $40,000 of PWA money and $15,000 from Federal-Aid secondary road funds.

Equipment and Garages

The county maintains six garages, one of which is designated as the Central Garage and is located at Blue Earth. It is a little larger than the others and more completely equipped for overhaul-

(Concluded on page 35)

New Flashing Lantern

The Pasico Hi-Way lantern, made by the Pacific Signal Co., Inc., 3517 Virginia Ave., Lynwood, Calif., is a positive flashing lantern for temporary road hazards such as construction or maintenance work under way on the highway, stalled trucks, and emergency crews at work. The mechanical flasher consisting of an Eveready Mazda lamp operating on an Eveready battery provides more than 240 hours of service, or more than 20 nights, according to the manufacturer.

The Fresnel lens is practically unbreakable and is visible in all directions for over 2 miles, it is stated. Constructed of die metal, Bakelite and bronze, the lantern contains nothing to rust or deteriorate, and needs no cleaning. The mechanism is hermetically sealed.

Complete information on these emergency warning flashers is contained in literature which interested state and county highway departments, state highway patrols and contractors may secure direct from the manufacturer.

RENT a New "Simplified" ARC WELDER

No labor lost, no expensive replacement parts. Make repairs right on the job . . . use the economical new welded construction.

The HOBART Gas Engine drive Portable.

30 DAYS TRIAL At Our Risk... Ask for Details write for FREE Book

"NEW PROFITS in Arc Welding" Book sent free.

Hobart Bros. Co. Box CE-109 TROY, OHIO

One of the World's Largest Builders of Arc Welders

HOBART WELDERS

The Fastest Selling Welders on the Market Today.

Repair Equipment on the job | Get Low Cost Construction | Build Steel Forms Economically

BUCYRUS ERIE Announces the new...2½ yard... 54-B

Big Machine STRENGTH Small Machine SPEEDS!

Diesel SHOVEL-DRAGLINE-CRANE

The only machine of this size with conical hook swing rollers in double-flanged roller path . . . independent power - controlled boom hoist . . . swing clutches that are revolutionary in simplicity and smoothness of operation . . . special "swampcat" mountings for dragline service . . . quarry-type shovel front-end . . . fast, long-range dragline . . . ships on most U. S. railroads without major dismantling. Available also electrically driven — single motor or 3-motor with Ward Leonard Control. Write for full details on the new 2½-yard leader.

A matchless combination of power, strength, speed and operating ranges.

"Years Ahead" design combining features which have been thoroughly field developed and proven by unmatched performance of the 120-B and 10-B groups of Bucyrus-Eries. Outstanding, modern, destined to be imitated, the new 54-B is revolutionary in its ability to deliver big, low-cost output in the toughest digging. Find out now what 54-B performance can mean to your pocketbook.

D-28

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN

A Cornett Sloper in Operation on a Bank 35 Feet High

New Sloping Device For Use With Shovel

A new device for bank sloping which can slope from the vertical to an approximate horizontal, according to the manufacturer, has just been announced by Cornett Sloper, 607 Degraw St., Brooklyn, N. Y. This device, which is designed for attachment to any shovel in an hour's time, is placed on the end of a shovel tooth, thereby eliminating the necessity of removing the bucket. With the shovel boom elevated to approximately vertical and a 20-foot sloper boom, the unit reaches to a height of 40 feet. Longer sloper booms are available.

This Cornett sloper was used on a bank 350 feet long and 35 feet high, consisting of a layer of sand, a hard layer of clay, and a layer of loam, each layer being approximately 11 feet thick. The material to be sloped ranged in thickness from 4 inches to 2 feet. The manufacturer reports that 12,250 square feet of bank was sloped in 8 hours.

Protecting Exposed Steel Structures

Two installations of particular interest to engineers and contractors who face the problem of protecting steel plates or pipes which are exposed to water have recently come to our attention. One of these is the case of the inside of a steel penstock of the Pacific Gas & Electric Co. In 1913 only a small patch of Bitumastic enamel, furnished by Wailes Dove-Hermiston Corp., 17 Battery Place, New York City, was applied on the bottom section of the penstock as an experiment. The last inspection, made just a few months ago, showed that the enamel was in perfect condition and the steel to which it had been applied was free from any corrosion, while the balance of the penstock showed considerable corrosive attacks. One important fact that came to light was that the enamel has not been damaged by abrasion, in spite of the fact that the penstock carries a certain amount of silt, floating wood, pebbles and even rock at times.

The other is the case of a steel drydock in England which was recently broken up because it had become too small to be profitable. The dock was built in 1892 and was coated with Bitumastic enamel at the time the dock was built. An inspection of the steel plates when the dock was being broken up showed that the enamel was as good as the day it was installed and had protected the steel against corrosion for 46 years. The producer of Bitumastic believes that this is a world's record for the protection of steel from the attacks of salt water.

Vermont State Garage Self-Sustaining Unit

The administration and operations of the state garage of the Vermont Department of Highways are financed entirely by the Machinery Fund, making this division of the department a self-sustaining one. State equipment is employed on construction and maintenance projects at a rental rate which pays for the unit during a normal lifetime. Supplies, machinery and competent operators are kept available to fill the requirements of the district highway commissioners who have jurisdiction over state force-account operations.

Repairs to state equipment are made by skilled mechanics at the garage or in the field. A considerable item of work recurring annually is the mounting of snow plows and sanding apparatus on trucks from the various highway districts, and also the maintenance of this equipment during the winter. Eight mechanics, one blacksmith-welder, one mechanic-welder, seven sign men, two carpenters, two stock men, twenty-six machine operators, six laborers and two watchmen are employed at the state garage.

The state garage erects and maintains all highway signs and markers on the state highway system, besides taking care of all center-line and zone painting. Similar work is also done on a limited mileage of state-aid roads, especially those which form a part of the numbered route system. The policy and type of signs conform to the standard developed by the American Association of State Highway Officials and the U. S. Bureau of Public Roads (now the Public Roads Administration), which are generally in use throughout the country. As a part of its sign work, the state garage also prepares direction markers for towns. These signs are furnished at their cost price of one dollar each, and already many towns have taken advantage of this service.

There was recently completed at the state garage a modern brick office building equipped with independent automatic heating and winter air conditioning. The second floor provides quarters for the State Highway Planning Survey personnel, while the first floor is occupied by the garage office force. This and other buildings such as offices, storage garages and sheds erected for district highway commissioners, have been paid for from the Machinery Fund.

Features of Tractor Described in New Catalog

The Allis-Chalmers Model S tractor, designed to take advantage of the extra power in the high octane gasolines now available, is described in a new 24-page two-color catalog recently issued by the Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee, Wis. The catalog states that this tractor is giving increased power with low fuel consumption because its higher compression engine utilizes the last ounce of power in stepped-up fuel. This increased compression, combined with automatic spark advance and economizer carburetor, is claimed to cut gas consumption to a minimum.

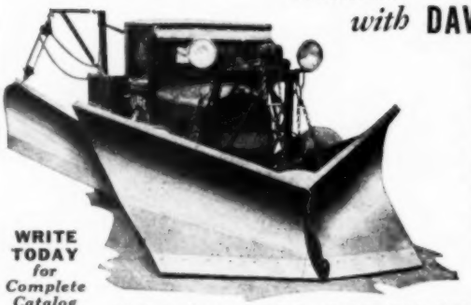
Attention is also called to the new Super-Seal rollers with which the Model S is equipped and which require lubrication only once every 200 hours. Complete information on these and other features of the A-C Model S tractor is contained in this new catalog, copies of which may be secured direct from the manufacturer.

A New Ring-Bound Catalog Of Bolts, Nuts and Rivets

The Pittsburgh Screw & Bolt Corp., 2719 Preble Ave., N. S., Pittsburgh, Pa., has recently issued Catalog No. 39 which contains a complete listing of its line of bolts, nuts, rivets and rods, with general information and suggestions for the best manner of ordering. The various tables of these items show the weights and give all dimensional details. Copies of this catalog may be obtained free on request.

UNSURPASSED *Snow Removal with* PERFORMANCE

DAVENPORT-FRINK SNO-PLOWS



Meet winter problems with the safe, speedy low cost ability of Davenport-Frink Sno-Plows. Types for every snow clearing job and every type of tractor or truck. Write for information on how to save time and money while doing a better job.

WRITE TODAY *for Complete Catalog*

Made in Eastern U.S.A. by Carl H. Frink, 1000 Islands, Clayton, New York

DAVENPORT BESLER CORPORATION 4220 Rockingham Road Davenport . . . . Iowa

Right Down to Fighting Weight

You want more than dead weight in a bucket to lick a tough digging job. You want speed—agility! Williams design, welded construction and special alloys insure stamina and ruggedness, without excessive weight. Williams Buckets carry plenty of weight, but they carry it in the right places and in the right proportions. You move more materials in less time with Williams Buckets—and that's profitable.

. . . and if that's what you want in a bucket, you'll find your particular type in the Williams Catalog. It's free!

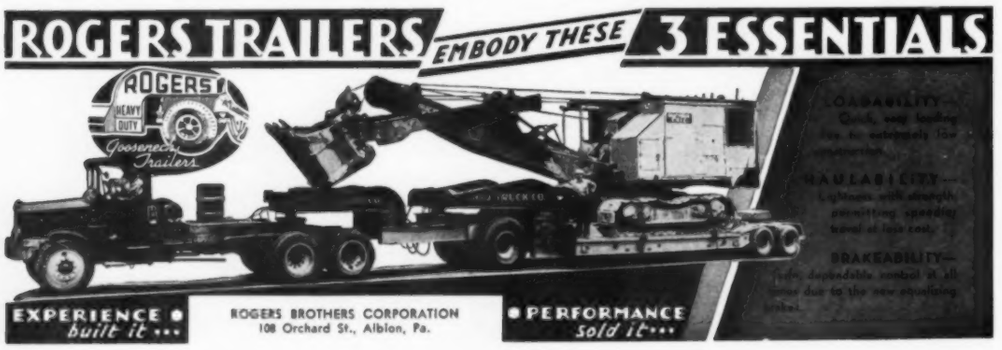
THE WELLMAN ENGINEERING CO.
7012 CENTRAL AVE. ● CLEVELAND, OHIO
SEND FOR CATALOG

Distributors located in all parts of the country represent the Williams Line of Power-Arm, Multiple Rope, Power-Wheel, Single Line, Hook-On and Dragline Buckets.

WILLIAMS *Buckets* built by WELLMAN

★ BUILT TO LAST..*and* MOVE DIRT FAST! ★

ROGERS TRAILERS EMBODY THESE 3 ESSENTIALS



EXPERIENCE ● *built it . . .*

ROGERS BROTHERS CORPORATION
108 Orchard St., Albion, Pa.

● PERFORMANCE *Sold it . . .*

Change of Address

(Mail to Contractors and Engineers Monthly, 470 4th Ave., New York, *today*)

From _____
(Old address)

_____

_____

To _____
(New address)

_____

_____

Name _____

The New No. 212 Motor Grader

New Motor Grader Has Diesel or Gas Power

The new 32-hp motor grader, the No. 212, recently announced by the Caterpillar Tractor Co., Peoria, Ill., is available with either diesel or gasoline engine. Every blade position possible with the larger No. 12 and 112 models is obtainable on the No. 212, making it possible to cut ditches and slope banks, widen and re-grade roads from bank to bank, scarify and reshape pitted surfaces on gravel roads, maintain road surfaces, and mix and spread light oil mat, according to the manufacturer.

The overall width of this new machine is 6 feet 8 inches and a 10-foot blade makes it adaptable for use on narrow roads where traffic would find it difficult to pass a wider machine. A full-revolving blade permits the machine to work in reverse. The No. 212 is offered with single drive only, and is equipped with 12.75-20 single low-pressure tires. The ground contact afforded by these large tires, with the engine weight directly over the driving wheels, provides well-balanced traction to utilize the available horsepower.

This new machine, completing the Caterpillar line of all-purpose motor graders and particularly designed for use by county and township highway departments, is described and illustrated in a new bulletin, copies of which may be secured direct from the manufacturer or from this magazine.

New Speedometer Aid To Truck Operation

A new Shiftoguide speedometer, which does away with guess work in gear shifting and virtually does everything that a tachometer would do for a truck operator, has been introduced by the Ford Motor Co., Dearborn, Mich., as standard equipment on all Ford regular and cab-over-engine trucks, except the ¾ and 1-ton types.

The dial of the Shiftoguide speedometer shows at a glance the correct speed ranges in which the truck should be operated in low, second, third and high gears. As the speedometer pointer crosses the line dividing the different ranges, the operator knows that that is the correct time to shift gears up or down as load and road conditions demand. This makes for reduced engine wear and improved operating economy, even with inexperienced operators, according to the manufacturer.

Ford engineers point out that truck engines develop their greatest pulling ability within a definite range of engine speeds. Because of this, in order to provide maximum performance, it is necessary to keep the engine running in the speed range where maximum torque is being developed, and then to shift gears according to road requirements. When an operator is accelerating a big load in low gear, there is a tendency to speed up to more than 6 miles an hour, not realizing that this means racing the engine and shortening engine life.

Thus this new Shiftoguide enables the operator to get maximum pulling ability, making it easier for the truck to pull the load, giving better gas mileage and helping the operator to make faster time on a run.

Trailer Dump Wagons

The Koehring Trail-Dump is a high-speed, flexible, economical, high-production tool, according to the manufacturer, the Koehring Co., 3026 W. Concordia Ave., Milwaukee, Wis. Mounted on pneumatic-tired wheels, it can travel, loaded, at various speeds as high as 20 miles per hour, has more than ample load flotation and can haul over rough grades as well as prepared haul roads. It has a wide body top opening which facilitates loading; a short turning radius of 10 feet; a free-oscillating hitch from wagon tongue to tractor, thus reducing strain between tractor and wagon, and free swinging; and gravity-impelled doors, released by a lever within easy reach of the operator, provide quick dumping.

These and other features of the Trail-Dump are described in detail and illustrated in a new catalog, copies of which may be secured by those interested direct from the manufacturer, or from CONTRACTORS AND ENGINEERS MONTHLY.

There's a SIMPLEX for Every Construction Need!

For every construction job calling for jacks there's a Simplex Jack to do the job faster, safer, easier and at a lower cost — *and lots of jobs where you don't ordinarily use jacks can be done better with Simplex Jacks.*

Building, raising, lowering or moving; bridgework, sunken highway slab raising, concrete form leveling, temporary adjustable supporting and hundreds of other construction and equipment maintenance jobs demand the use of Simplex Jacks for real economy and efficiency. Every one accurately tested and guaranteed to lift its full rated capacity.

Over 217 models for every requirement.

Engineering	*Building*	*Sewer and Water*
Tunnel Roof Supports	Screw Jacks	Pipe Pushers
Cable Tensioning Jacks	Geared Jacks	Pipe Pullers
Post Pulling Jacks	Journal Jacks	Trench and Timber Braces
Emergency Jacks	Timber Braces	Cable Reel Jacks
Automatic Lowering Jacks	Shoring Jacks	

Sold by leading supply houses. Write for bulletin or special information.

TEMPLETON, KENLY & CO., Chicago, Ill.
Better, Safer Construction Jacks Since 1899

SIMPLEX
GOLD MEDAL AWARD SAFETY JACKS

WE SAID IT 5 YEARS AGO
—Now Hundreds of Users Have PROVED IT!

Back in 1933, we said, "The most practical way to build excavators from the user's point of view is with rolled alloy steels!" Now, users everywhere—hundreds of them—have *proved* that these stronger, faster operating machines are more profitable to own. Designs originated by P&H are gradually being adopted by the excavator industry. P&H has *all* these advanced ideas *now* in this line of excavators—"5 years ahead of the field." User experience is yours for the asking. Harnischfeger Corporation, 4419 W. National Ave., Milwaukee, Wis.

P&H EXCAVATORS 18 Different Sizes From ½ to 5 cubic yards Capacity; Gasoline, Diesel or Electric Power.

HARNISCHFEGER
CORPORATION
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

Rural Mail Boxes Now More Sightly

Texas Provides Supports For Single and Multiple Boxes Along Shoulders, And Gravel Approaches

(*Photos on pages 4 and 40*)

✦ HIGHWAY shoulders in country sections in many states are made unsightly by the manner in which rural free delivery mail boxes are supported at the side of the road. Sad replicas of our noble Uncle Sam, bell boys, and other home-made figures are used, or a post in an old barrel, or a wagon wheel with several boxes, are used all too commonly, much to the detriment of our rural roadsides. Mail boxes must be so located on the shoulder that the mail carriers may reach them readily from their automobiles, and still it must be possible to move the boxes for snow plowing in the north, and regular maintenance blading of the shoulders in all sections. Texas has solved this problem in a practical manner worthy of note by other states. In driving through the Lone Star State the neatness and uniformity of the mail boxes as regards support and location gives a distinct tidiness to the shoulders that frequently is sadly lacking.

How It Started

In 1933, Leo Ehlinger, District Engineer of District No. 23 of the Texas State Highway Department, at Brownwood, conceived the idea of a standard rural mail box support for all mail boxes on the highways in his district. The owners of the boxes cooperated by furnishing the materials for the bases and the Department furnished the posts and all necessary labor for construction and erection. In 1935, orders were issued to all District Engineers in Texas to construct and erect these supports according to a standard plan, the Department furnishing all materials and labor. In 1936, orders were issued to place a stable material on the shoulder as approaches to the boxes to prevent rutting of the shoulders and to eliminate mud from the pavement.

At the present time all rural mail supports on approximately 23,000 miles of highways in Texas have been constructed and erected in accordance with the original design with a few minor revisions. Rural mail carriers and the traveling public have been very commendatory in their praise and remarks, according to M. B. Hodges, State Maintenance Engineer, as by virtue of this construction the work of the carriers has been made much easier and the aesthetic appearance of the highways improved materially.

The Design

The standard support is a 1-foot 6-inch reinforced-concrete base, 3⅝ inches thick at the edges and 6 inches thick at the center where a 4 x 4 timber post is inserted. The reinforcing consists of scrap wire mesh or small bars as may be found at any district depot. The individual faces of the octagons are 7½ inches long. The boxes are supported at the uniform height of 4 feet above the ground and the bases in general are placed on the edge of the roadway crown. All lumber used in the construction of these supports and for the forms for the bases is salvaged material. After erection the supports are painted white and the boxes are painted aluminum, after which the owner's name is stenciled on the box. For best results the bottom 6 to 12 inches of the post is painted with two coats of standard white paint and allowed to dry before the base is cast about it. This prevents the post from swelling and cracking the concrete base and also retards the decay of the post itself.

The 1⅝-inch top supports for the boxes vary from 5⅞ inches wide for small boxes to 10½ inches wide for large boxes, with lengths of 1 foot 6 inches and 1 foot 10 inches respectively. The diagram on the back page, furnished by Mr. Hodges, shows the standard for the construction of these supports, while the illustrations on page 4 show single and multiple installations, as well as views of the boxes from a distance, illustrating how the approaches have been stabilized with gravel, the ease with which the box and support can be moved for shoulder maintenance, and a pair of typical before and after scenes which at a glance show the improved appearance made possible by these standard supports.

From records made available by Julian Montgomery, State Highway Engineer, through Mr. Hodges, the average cost of a single installation is approximately $1.00. Maintenance costs are comparatively small and are usually confined to repainting and stenciling about once every two or three years. This work is considered to be well worth the cost to the Texas State Highway Department.

New Rock Drill Catalog

The complete line of Ingersoll-Rand rock drills and associated equipment, and a brief and interesting history of rock-drill development are presented in a new illustrated 88-page catalog just published by the Ingersoll-Rand Co., 11 Broadway, New York City. Installation and shop views as well as tables of operating and physical characteristics for each class of equipment are included.

Individual sections are devoted to Jackhamers, paving breakers, drifters, Stopehamers, wagon drills, Jackbits, drill steel, sharpeners, Jackbit grinders, Calyx core drills, Coroc diamond drills, explorer diamond drills and submarine drills. New machines described include the JB30 Jackhamer, the CC80 paving breaker, the CC250 spike-driver, the SBR85 and SBR120 Stopehamers, the JMA and JMB Jackmills, the J3 and J5 Jackbit grinders, special Jackbits and power feed for drifters.

Eight pages of engineering tables and other useful data are also included in the book, Form 4301, copies of which may be secured direct from Ingersoll-Rand or from this magazine.

TARPAULINS
ROAD MATS ★
WINDBREAKS

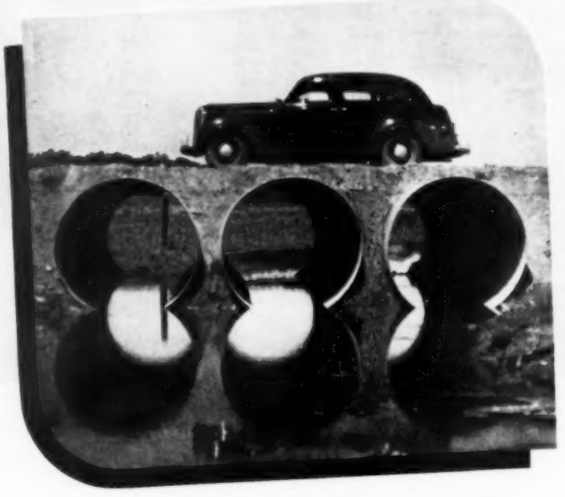
CONTRACTORS' SUPPLY DEALERS in every state sell the Fulton line. Specify SHURE-DRY and FULTEX Tents, Tarpaulins, and Windbreaks—anything made of canvas. Also Fulton Road Mats and Burlap. Fulton products are good and their prices are right.

write for prices

If your dealer can't supply you write our nearest plant for catalog, samples and price list.

Fulton Bag & Cotton Mills
Manufacturers Since 1870
ATLANTA ST. LOUIS DALLAS
MINNEAPOLIS NEW YORK NEW ORLEANS KANSAS CITY, KAN.

LET THE HIGHWAYS THEMSELVES MAKE YOUR PIPE DECISION



There is no test more conclusive than performance, and it is here that GOHI Corrugated Pipe demonstrates its amazing endurance, its ability to deliver trouble-free service under the most severe conditions at the lowest per year cost. Economical to buy, to install, to maintain, GOHI Corrugated Pipe is the logical answer to highway and other drainage problems. Complete information and copy of 72-page book on modern culvert practice on request. Address fabricator nearest you.

GENUINE OPEN HEARTH IRON GOHI PURE IRON-COPPER ALLOY

GOHI Pipe meets Copper-Bearing Pure Iron requirements in all specifications published by nationally recognized specifying authorities.

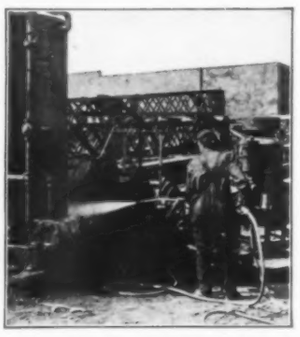
New England Bolt Co. . . . . Everett, Mass.
Central Culvert Co. . . . . Ottumwa, Iowa
Capital City Culvert Co. . . . . Madison, Wis.
Bancroft & Martin
Rolling Mills Co. . . . . S. Portland, Me.
Denver Steel & Iron Works Co. . Denver, Colo.
The Lane Pipe Corporation . . . . Bath, N. Y.
Dixie Culvert Mfg. Co. . . . . Little Rock, Ark.
St. Paul Corrugating Co. . . . . St. Paul, Minn.
The Newport Culvert Co. . . . . Newport, Ky.

GOHI PIPE
CORRUGATED

GOHI CULVERT MANUFACTURERS, INC.,
NEWPORT, KY.

Save 25 to 40% of Time and Labor on Equipment Overhauling with HYPRESSURE JENNY

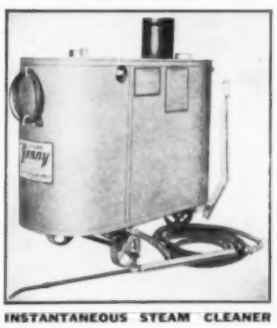
Contractors and Highway Departments report savings of 25% to 40% in labor costs for maintenance of tractors, hoisting engines, rollers, trucks, graders, blades, etc. by steam cleaning with HYPRESSURE JENNY before repair, overhauling, or repainting. HYPRESSURE JENNY'S thorough cleaning permits closer inspection, and better and quicker repair and repaint jobs; helps keep your equipment on the job; also replaces cumbersome steam boiler for heating water, sand, and gravel on construction job. Find out how much HYPRESSURE JENNY can save YOU. No obligation. Just mail the coupon for free survey.



Mail THIS COUPON FOR FREE SURVEY

HOMESTEAD VALVE MFG. COMPANY
P. O. Box 30, Coraopolis, Pa.

Tell us how, and how much JENNY can save us.
We have ..... men employed on equipment maintenance.
We repair ..... pieces of equipment monthly.
We repair ..... trucks monthly.
We repaint ..... trucks monthly.
We want to clean .....
Name .....
Address .....



INSTANTANEOUS STEAM CLEANER

Unusual Centering Used On Texas Arch Bridge

(*Continued from page 19*)

blocked off to carry the stringers horizontally for the planks for the workmen.

The carpenter crew for the forms consisted of four carpenters and six helpers, hand saws and a Rex portable circular saw driven by a 4-cylinder LeRoi engine.

Concrete Plant and Pouring

All aggregate for the concrete work was trucked in and stockpiled at accessible places for the mixer. The concrete plant was designed to be extremely flexible as it was thought best to carry the plant to the section to be poured rather than wheel concrete long distances. The contractor decided on a pair of Koehring 10-S mixers for the job with the batching being done with wheelbarrows weighed on Howe scales for accurate work. The concrete mixers were set up as close to the bridge section being poured as possible and then the mixed concrete discharged into an Acme ¾-yard bottom-dump bucket and swung up to the bridge by the Insley R300 crane with a 55-foot boom. The concrete was not vibrated but there were four men rodding during all the pours on the arches and also for the piers. The concrete was placed with an 8-inch elephant-trunk chute from the bottom-dump bucket. There was no evidence of honeycomb on the structure and the rubbing needed was a minimum.

The concrete crew comprised six men wheeling to the mixer, one man weighing the barrows, one cement man who also spotted the bucket at the mixer, the mixer man, the crane operator, two men handling the bucket at the top and dumping it into the hopper of the elephant-trunk chute and the four men rodding. All rubbing was done by hand. The concrete was given a uniform 1½-minute mix for all work.

On the abutment piers no construction joint was permitted between the footing and the buttress which is 52 feet high. This required a monolithic pour of 448 yards which required the use of the two mixers for 36 hours. The forms for the abutment piers were set in rock on four 10-inch I-beams encased in concrete at the ends for solidity and the forms were built with a window where the skew-back entered the shaft so that the concrete could be poured at that elevation, eliminating the need for raising the concrete to the top of the structure.

The Interior Bents

The interior bents at the two ends of the structure required somewhat different handling for the concreting. They were set on 8-foot diameter steel cylinders of 5/16-inch plate with 3 x 3 x 5/16-inch circular wales. These were sunk to a maximum depth of 18 feet. The cylinder was sunk 15 feet 6 inches and then reamed out below for a depth of 2½ feet to reduce the loading. The cylinders were not sunk to rock but merely into a heavy marl. The pairs of footings for each bent carry 3 x 5-foot square shafts, forming a simple frame bent.

Personnel

The contract for the construction of the 579-foot spandrel arch bridge over Onion Creek was awarded to Cage Bros. and L. A. Turner of Bishop, Texas, on their low bid of $103,830.07. L. A. Turner was personally in charge of the work with Scott Clark as Superintendent for the combined outfit. H. E. M. Stevenson was Resident Engineer for the Texas Highway Department.

The importance of proper lubrication can not be stressed too often. If you have any special lubrication problems write the Editor.

Convertible Excavators

A 24-page catalog featuring the Buckeye Clipper convertible excavator has recently been issued by the Buckeye Traction Ditcher Co., Findlay, Ohio. Details of design and construction are given and the adaptability of the machine shown by action pictures of jobs in progress. Special attention is given to the patented Buckeye Mevac metered-vacuum power-control system for all operations which is used on all models of the Clipper. Built in three sizes, ½, ⅝ and ¾-yard capacities, the Clipper is convertible to shovel, trench-hoe, crane, clamshell, dragline and pile driver. Copies of this catalog may be secured by those interested direct from the manufacturer or from this magazine.

3½ E. D. LANSING TRAILER MIXER

This new Lansing Trailer Mixer is faster, more compact and easier handled. Its overall length is only 57" and entire width 68", with a height of 65".

It has a convenient shoveling height of only 42½", with a 31-inch drum. Sturdy 1⅞" axles, and 26" wheels with pneumatic tires. Weighs only 950 lbs. Write or wire NOW for complete information.

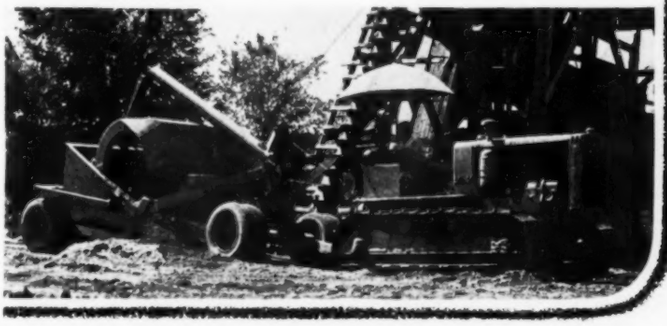
LANSING COMPANY
LANSING, MICHIGAN
CHICAGO NEW YORK BOSTON PHILADELPHIA MINNEAPOLIS KANSAS CITY SAN FRANCISCO LOS ANGELES

"Washing twice as much gravel as before"..

LOADING 6 loose yards each bite

HAULING 540 feet to the hopper

DUMPING 72 loose yards hourly



. . . says Peoria Concrete Construction Company's pit operator. That in itself would justify modernization of their East Peoria, Illinois, plant. They've combined loading, hauling and dumping into one operation with the LeTourneau Carryall Scraper method. Chief advantage over former drag line systems is Carryall flexibility . . . to bring gravel to the hopper from anywhere in the pit.

But doubled plant production by no means completes the picture of profitable operation . . .

***One* LOW-COST-PER HOUR OPERATION...**

takes care of initial overburden removal, too. It's no trick to alternate between actual aggregates production and stripping this Carryall way! With 8 to 15 feet of clay topsoil to be removed from the 20-acre area, the operator has preplanned stripping for constant down-hill loading . . . that gives him capacity loads in the shortest possible time. It's the right way to take fullest advantage of the Carryall savings! At the same time, overburden is being wasted into worked-out sections, leaving the site in its original useable form for profitable resale.

Behind Peoria Concrete Construction's choice of a LeTourneau Carryall for the work lies a recommendation for you. It's the only equipment to cut overhead on every operation between the pit and the hopper! Your LeTourneau and "Caterpillar" dealer will say it with a demonstration. R. G. LeTOURNEAU, INC., Peoria, Illinois, Stockton, California.

ANGLEDOZERS*, BULLDOZERS, ROOTERS*, POWER CONTROL UNITS, DRAG SCRAPERS, PUSH-DOZERS, SHEEP'S FOOT ROLLERS, CRANES, TREE-DOZERS. *Name Reg. U. S. Pat. Off.

LE TOURNEAU
*Carryall** **SCRAPERS**

The Midtown Tunnel In New York City

Project of New York City Tunnel Authority Will Be Completed in 1940 by the Walsh Construction Co.

✦ THE Queens Midtown Tunnel, New York City, which will form an arterial highway connection from Queens, Brooklyn and Nassau County to Midtown Manhattan, is now under construction and will be completed in 1940. It will provide relief for traffic congestion on existing East River bridges, the overcrowding of which has been an increasingly serious problem for many years. During 1925, over 53,000,000 vehicles used the East River crossings, while for the year ending July 31, 1937, the traffic totalled over 98,000,000 vehicles, and it is estimated that this figure will be increased to 120,000,000 by 1940.

The tunnel, which will consist of two twin-lane tubes, is now being constructed by the New York City Tunnel Authority with funds provided as a loan and grant by the Federal Public Works Administration. The estimated cost is $58,365,000, of which $47,130,000 is a loan and $11,235,000 an outright grant. The project will be operated as a toll crossing on a self-liquidating basis and is estimated to have a maximum annual capacity of 16,000,000 vehicles. Ground was broken for the project on October 2, 1936.

In Manhattan, New York City, the plazas for entrance and exit will be between 36th and 37th Streets and First and Third Avenues. The Queens plazas will be north of Borden Avenue, immediately east of Vernon Avenue, Long Island City. From the plazas on both sides there will be appropriate connections to streets and highways so as to make convenient ingress and egress possible from all directions. In Manhattan, provision is being made for connections to the proposed Manhattan underpass beneath the city connecting with the Lincoln Tunnel under the Hudson River on the west, which would make possible a continuous ride from New Jersey under Manhattan to Long Island.

The Queens Plaza is being constructed by the Thomas Crimmins Contracting Co., and the open cut portion from the Queens plaza to the river tunnels is being constructed by Charles F. Vachris, Inc. The Walsh Construction Co. has the contract for tunneling under the East River. The portion from the Manhattan end of the river tunnel to the Manhattan Plazas is being constructed partly in tunnel and partly in open cut by the Woodcrest Construction Co., Inc., and Rosoff Bros., Inc., and the Manhattan Plazas are being constructed by the George J. Atwell Foundation Corp. The ventilation buildings in Manhattan and Queens and the service building in Queens are being constructed by the Cauldwell-Wingate Co.

Tunnel Statistics

The north tube of the Queens Midtown Tunnel, which will accommodate westbound traffic from Long Island to New York, will be 7,785 feet long and the distance between portals, or tunnel entrances, will be 6,435 feet. The south tunnel, which will accommodate eastbound traffic from New York to Long Island, will be 7,500 feet long and the distance between portals, 6,270 feet. The length of the under-river portion of the tunnels is 3,055 feet and the distance between ventilating shafts 4,071 feet.

Each tube will have a minimum roadway width of 21 feet and a headroom of 13 feet 6 inches. The external diameters of the finished tunnels are 31 feet and 32 feet, 10 inches. The maximum upgrade is 3.5 per cent and the maximum downgrade 4 per cent. The maximum depth from mean high water to the top of the tunnel is 73 feet and the maximum depth from high water to the roadway is 95 feet. The cast iron lining has a total weight of 64,700 tons.

The tunnel will be ventilated by 46 fans located in two ventilation buildings. The normal ventilation will consist of 2,826,000 cubic feet of fresh air per minute, or 42 air changes per hour.

Personnel

Ole Singstad is Chief Engineer of the New York City Tunnel Authority, with William McK. Griffin, Deputy Chief Engineer, Jacob Mechanic, Engineer of Construction, and John J. Nanry and Denzil W. Coe as Resident Engineers.

Dwarf Digging Buckets

Hayward dwarf orangepeel buckets and the Hayward Midget digging machine, designed for digging and handling all types of materials in small and cramped quarters, are described and illustrated in Bulletin 658 issued by The Hayward Co., 50 Church St., New York City. The smallest of these buckets will operate inside a 12-inch pipe. They are similar in construction to the larger Hayward orangepeels, duplicating the various parts in a smaller size and using the same Hayward closing and opening mechanism. They may be operated by hand, by a Midget derrick, or from the niggerhead of a small portable winch.

The Midget digging machine is a combination of a small hand-operated derrick and a dwarf orangepeel bucket and is built in three sections: the boom, the mast and the base. Each section is so light that two men can easily carry it and the entire machine, which can be loaded on a truck and transported from job to job, can be set up ready for work in less than 20 minutes, according to the manufacturer.

Copies of Bulletin 658 describing this equipment for digging operations in cramped quarters may be secured by those interested direct from the manufacturer or from this magazine.

New Bucyrus-Erie Dealer

The Clarence L. Boyd Co., with headquarters at Guthrie, Okla, and a branch office at 17-19 West Pottawatomie St., Oklahoma City, has been appointed distributor for the state of Oklahoma by the Bucyrus-Erie Co., South Milwaukee, Wis. Boyd will handle a complete line of Bucyrus-Erie shovels, cranes, draglines and clamshells.

ELECTRIC LIGHTS
anywhere with KATOLIGHT Plants
Furnishes 110 AC for floodlights, portable saws, drills, etc.
Also 6 & 12-volt engine-driven battery chargers for charging batteries without removing from car, truck, or tractor.

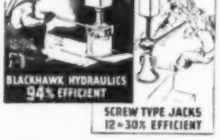
Prices $60 and up. Also AC generators & Rotary Converters.
KATOLIGHT
109 Elm St.
Mankato, Minnesota

100,000 LBS. OF POWER
At less than $2.00 per ton!

MODEL GA-11 HEAVI-LIFT
...latest addition to the big family of
Blackhawk Hydraulic Jacks
New! Weighs only 120 lbs.—yet lifts 50-ton load easily and safely to total height of 16¾". Has 11" collapsed height. (Can be equipped with gauge).
$97.50 Net to user...Slightly higher on West Coast and in Canada.

THIS latest Blackhawk Hydraulic Jack development gives construction new lifting brawn — 50 tons of giant hydraulic power in a rugged unit weighing only 120 pounds — 11 inches in height. Like all Blackhawk Hydraulic Jacks, this new model provides tremendous power with smooth, easy strokes—always under finger-tip, precision control.

One man can operate it at capacity — because all Blackhawk Hydraulics provide 94% efficiency as against the 12% to 30% efficiency of average mechanical jacks. You get real SAFETY —there can be no sudden dropping of a load as happens when a "mechanical" shears a tooth. What's more, here's a brute for strength that is compact, easy to position — yet compares most favorably in price with big, unwieldy, mechanical jacks.

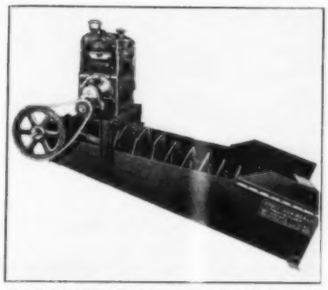


BLACKHAWK Hydraulics Lift These Weights:
Hand Jacks — 1 to 75 tons.
Gauge Equipped Jacks—7 to 75 tons.
Inverted Jacks — 7 to 50 tons.
Remotely Controlled Jacks — 10, 20 and 50 tons.

MULTIPLY MAN POWER
Blackhawk offers a complete line of heavy-duty, gauge-equipped, and remotely controlled hydraulic jacks—1 to 75 tons capacity. Write for data on Blackhawk Hydraulic Jacks as applied in general and special construction and engineering work.
A Product of BLACKHAWK MFG. CO.
Dept. J18109 MILWAUKEE, WISCONSIN

BLACKHAWK
WORLD'S LARGEST MANUFACTURER OF HYDRAULIC JACKS

BUFFALO-SPRINGFIELD
3-AXLE TANDEM — 3-WHEEL AND TANDEM ROLLERS
12 MODELS — 2 to 21 TONS — GASOLINE OR DIESEL POWERED
TRENCH ROLLERS — PORTABLE ROLLERS
THE BUFFALO-SPRINGFIELD ROLLER CO.
SPRINGFIELD, OHIO



An Eagle Double-Screw Sand and Gravel Washer Now Equipped with Hercules Diesel Power

Sand Washer Now Has Diesel-Engine Power

An interesting new application of diesel power to construction equipment was recently announced by the Hercules Motors Corp., Canton, Ohio. A double-screw sand and gravel washer, made by the Eagle Iron Works, Des Moines, Iowa, is now powered by a Hercules diesel 4-cylinder power unit Model DOOB, with a 3¾ x 4½-inch bore and stroke. As can be seen in the illustration, the washer is a completely self-contained unit with the engine readily accessible for servicing, yet out of the way as far as the operation of the washer is concerned.

This Eagle washer consists of two spiral screws each 12 feet long. These screws draw the aggregates to the center of the tub and convey them upward to the discharge end. Wash water inlets are arranged along the tub between the two screws. In operation, the wash water swirls upward through the aggregates, carrying the foreign matter to the surface and down to the lower waste-water discharge end of the tub. Timken roller bearings carry the upper ends of the spiral screw shafts and Cutless rubber bearings are used at the lower ends of the shafts which are subjected to the abrading action of the sand and water.

New Tamping Roller For Compacting Fills

A feature of the new Galion sheepsfoot roller, recently announced by the Galion Iron Works & Mfg. Co., Galion, Ohio, is the special hitch which makes it easy to couple the roller to a tractor, as well as to couple the rollers together to work in tandem of singles, doubles, or any other arrangement desired, depending on the power available.

The feet of these new rollers are distributed over the surface of the roll in such a manner as to provide the most effective working of the earth to insure proper compaction, according to the manufacturer. As the roller revolves, the feet are cleaned by passing through a set of teeth on the frame cross member. The rolls are 40 inches in diameter and 48 inches wide, with 7-inch feet. The weight of the rollers depends on the number of feet, which may be 64, 72, 88, 96, 112 or 120 as desired. The weight of each roll may be increased by water ballast. The frames are of sturdy construction to withstand severe service, and may be coupled together to work in pairs or triples, with full flexibility provided to follow the irregular contour of the fill surface.

Further details on this new sheepsfoot roller for tamping earth fills, embankments and earth dams are contained in a new bulletin which may be secured direct from the manufacturer or from this magazine.

Winter and Summer Service From Highway Equipment

A new and unusually well-illustrated booklet, Form 5566, has just been issued by Caterpillar Tractor Co., Peoria, Ill., under the title "Snow Fighters". The pamphlet, while showing the wide diversity of attacks possible in handling snow removal with this company's equipment, also shows this equipment at work during the spring, summer and fall in maintenance operations, thus demonstrating the year-round value of present-day modern highway-maintenance equipment.

New Bulletin Describes Uses of Util-A-Tool

Bulletin P & P 40, recently issued by Templeton, Kenly & Co., Chicago, Ill., manufacturer of Simplex jacks, shows the Util-A-Tool at work pushing, pulling, clamping, bending, spreading, hoisting and on wheel-pulling jobs. It also describes the many other jobs which this "tool of a thousand uses" performs, explaining in each case how it is used.

Copies of this bulletin, which also contains the specifications and dimensions of the five sizes in which the Util-A-Tool is available, may be secured direct from the manufacturer or from this magazine.

PRISMO

AT THE ATLANTIC CITY SAFETY CONGRESS
(October 16th-20th)

PRISMO *Announces—*

A new technical bulletin profusely illustrated to show the lasting qualities of Prismo materials in over a year's service on the Harrisburg-Hershey highway (U.S. 322-422). The results of this survey are of interest to each and every highway engineer engaged in the promotion of safety.

A limited number of copies are available—
When writing for yours mention Bulletin 939

PRISMO SAFETY CORPORATION
HUNTINGDON, PENNA.

THE OUTSTANDING TRUCK FOR THE MONEY

FORD V-8 FOR 1940

FORD FEATURES FOR 1940

New styling • Increased engine accessibility Increased chassis accessibility • Choice of power—95, 85, 60 hp • 42 body and chassis types • New Sealed-Beam Headlamps • Bigger batteries, larger generators with automatic voltage regulation • Big hydraulic brakes • Full-floating rear axle with straddle-mounted pinion and ring gear thrust plate Two-speed axle (optional at extra cost) Ford Engine and Parts Exchange Plan.

The big new 1940 Ford Truck line gives you value in construction, performance and economy that means "the outstanding truck for the money."

Three eight-cylinder engine sizes—95, 85 and 60 hp. Six wheelbases. 42 body and chassis types.

There's new styling. New engine and chassis accessibility, making it easier to check the oil, service the distributor and other engine accessories, as well as clutch, transmission and rear axle. New, softer, more comfortable seats in Regular cabs. These and many more improvements join a host of time-tested, time-proved Ford features in 1940.

See the new Ford Truck at your dealer's. Compare it with any other truck. Arrange for an "on-the-job" test and know the difference before you spend another truck dollar.

Ford Motor Company, Builders of Ford V-8 and Mercury Cars, Ford Trucks, Commercial Cars, Station Wagons, Transit Buses

New Traffic Safety Device Installed in Minn. and Ill.

Announcement has been made by Traffiscope, Inc., 2500 Rand Tower, Minneapolis, Minn., that Traffiscope installations have been made in Minnesota as well as in Pennsylvania and Connecticut and that the State of Illinois recently ordered its first unit.

The Traffiscope is a device which permits drivers of cars going up a hill to see what is beyond them over the crest of the hill top. The manufacturer states that in 54 months of experience with the Traffiscope, there has never been an accident on a hill protected by one of these units, although most of the locations where they have been installed were chosen because of a previous bad accident record.

Concrete Cribbing

Massey Concrete Products Corp., Chicago, Ill., and 50 Church St., New York City, has recently issued a catalog describing and illustrating Massey Type H concrete cribbing and its many applications. As retaining walls for highway projects, it provides adequate drainage, since cribbing permits water to pass through the wall freely, and is also pleasing in appearance. It is used in the construction of wing walls for bridges and culverts, along streams that have to withstand the action of ice and drifting debris, and for flood control for dykes or raising the level of existing levees.

Instructions for the installation of concrete cribbing, general specifications, typical wall sections and details of standard units are also included in this catalog. Series A No. 1, copies of which may be secured from the manufacturer.

New Marion Shovel Office

Announcement has been made by the Marion Steam Shovel Co., Marion, Ohio, of the establishment of a branch office at Pittsburgh, Penna., to handle the western section of the state. The eastern section will continue to be covered by the Philadelphia office, of which Harry L. Cox is Manager.

John Quigley, who has been associated with the Engineering Department of the company for many years, will be in charge of the Pittsburgh office, with headquarters at Room 722, Gulf Bldg.

GIVE THEM BOTH WITH-

LOW COST STANDARD OIL ASPHALT ROADS

WHAT THEY WANT!

● ISN'T THAT your problem in a nutshell? But you can't blame the farmer for wanting faster, all-season roads to his market, or the motorist for wanting relief from crowded highways. On the other hand, with steadily mounting taxes, the property owner has some argument on his side.

Giving them both what they want is not just a theory. Many Municipal and County road officials in widely separated sections of the middle west are doing just that. They choose the right type of Standard Oil Asphalt and the type of road or highway construction to meet their local conditions, traffic requirements *and* highway budget. They have gradually built up systems of improved highways and streets without burdening anyone with high taxes.

There are competent Asphalt representatives right in your locality to help you in this. Let the representative in your territory in on your problem. You can reach him through the local Standard Oil (Indiana) Office or by writing 910 South Michigan Avenue, Chicago, Illinois.

Asphalt for every purpose STANDARD OIL COMPANY (INDIANA)

C. & E. M. Photo

Top, the Spreader Box Used by the Griffith Co., with the Chains Laid Out Ready for the Next Truck. Bottom, Close-up of the Hitch for the Boxes

Safe and Sane Hitch For Spreader Boxes

System and care are the two chief allies of the contractor in preventing accidents on any job. On an asphaltic concrete paving job of Griffith Co. on U. S. 99 near Newhall, California, recently we saw a very interesting example of the care which a contractor can take to make a task safer.

The spreader boxes for the asphaltic concrete were equipped with heavy metal shoes 8 inches wide and 8 feet long to carry the heavy box and its load over the surface easily and even made it possible to back the boxes short distances with no damage to the road and no tipping of the boxes. The chains for attaching the boxes to the trucks for pulling them forward and spreading the mix were always carefully laid out in the shape of a double hook, as illustrated, so that they were always in the right position when the truck backed over them and it was easy and safe for the spreader box men to reach in and hook the chain to the special slotted braced iron plate bolted to either side of the truck frame just ahead of the rear axle, as shown. This is a very quick hitch and a safe one, and can be studied advantageously by many paving contractors using spreader boxes for crushed stone or gravel, stabilized and pre-mixed materials, as well as the spreading of asphaltic concrete and sheet asphalt.

4-Wheel-Drive Units

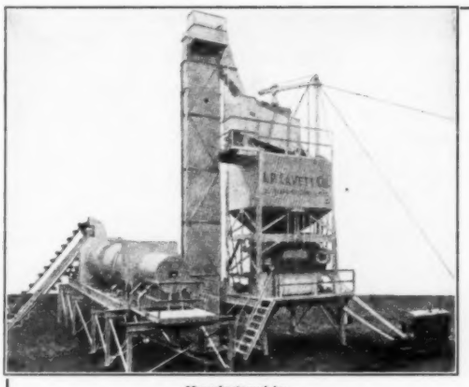
The features of Oshkosh 4-wheel-drive trucks and tractors are described in detail in an illustrated bulletin recently issued by Oshkosh Motor Truck, Inc., Oshkosh, Wis. According to the manufacturer, the Oshkosh 4-wheel-drive principle requires the transmission of power from the engine to the clutch into the transmission, and from the transmission through the sub-transmission to the front and rear axles. All units are mounted with three point suspension, thus eliminating breaking and straining when the truck is on rough ground.

State and county highway engineers and contractors desiring complete information on these units should write direct to the manufacturer and mention this item.

Shovel Lays Pipe In Close Quarters

Low overhanging wires above a pipe installation job presented difficulties to the contractor for laying 36-inch x 40-foot steel water pipe, as it was impossible to use a long crane boom to handle the pipe. For general utility duty on this and other jobs, the contractor had been using a P & H Model 255 crawler-mounted excavator which, during the course of this job, had been used as a shovel and was equipped with the standard shovel boom and dipper sticks.

Since it was impractical to convert this machine to a crane, the contractor removed the dipper sticks and dipper attachment from the shovel boom and used the excavator, equipped with the shovel boom only, as a crane to lift and lower the pipe into place. Following this, a clamshell bucket was used with the shovel boom for cleaning up operations.



PORTABILITY and CAPACITY

COMBINED IN THE NEW MODEL P-A PORTABLE MIXING PLANT

Write for Particulars Bulletin T-260

Manufactured by
HETHERINGTON & BERNER, Inc.
INDIANAPOLIS, IND.

NEW MODEL "99" LOADER SOLVES A MAJOR PROBLEM OF HIGHWAY MAINTENANCE AND CONSTRUCTION

After excess material in ditch has been pulled up and windrowed on the shoulder by the blade, the model "99" Loader picks it up and delivers it to the truck . . . saving from one-half to two-thirds of usual loading time.

Sod is skinned off shoulders by the model "99" Loader without previous blading.

● For the first time removal of excess material . . . a principal time-killer of ditch and shoulder maintenance, subgrade and shoulder construction can be handled with simplicity, ease and convenience.

The Austin-Western Model "99" Loader sets a new standard for clean, accurate, economical handling of excess materials on a wide variety of jobs. It is a real time-saver for cleaning ditches that have become dirt clogged, for trimming sod or earth shoulders down to the original grade, for picking up and loading excess dirt between forms on paving jobs, for balancing shoulders and for quick, clean loading of any windrow of loose dirt.

These jobs and many others are handled at savings of from one-half to two-thirds of usual loading time. On the job illustrated here, 45 trucks with 2-yard bodies were loaded in one hour. See your nearest A-W Dealer or write for full details. The Austin-Western Road Machinery Co., Aurora, Ill.

Austin-Western

Motor Graders
Roll-A-Planes
Rollers
Snow Plows
Crushing and Screening Plants
Washing Plants
Blade Graders
Motor Sweepers
Shovels and Cranes
Bituminous Distributors
Elevating Graders
5-Yard Tractor Scraper
6-Yard Tractor Scraper
8-Yard Tractor Scraper
12-Yard Hydraulic Scraper

THE NATIONAL CARBIDE V-G LIGHT

Gives you daylight conditions on night jobs.
Spreads a full, even beam of 8000 candlepower right where you need it.

Lights up the job for twelve hours on one 7-pound charge of National 14-ND Carbide and 7 gallons of water. Is easily handled by one man; has nothing to get out of order; no harm done if it tips over—just stand it up again, and it goes right on working. Weight 35 lbs. empty; 98 lbs. when full.

Write for catalogs on V-G Light, V-G Handy Light and Lantern

X-100

NATIONAL CARBIDE CORPORATION
LINCOLN BLDG. (Opp. Grand Central) NEW YORK

Ice Problem Exceeds That of Snow Removal

(Continued from page 1)

production schedules in factories, be maintained, regardless of the weather.

In Genesee County, Mich., ice control is of far greater importance than snow removal. There is an average of approximately 34 inches of snowfall per year, rarely in greater depths than 7 to 8 inches at a time. It is very seldom that 24-hour service on all the roads in the county is not maintained and it has been a great many years since any one could not travel the main roads at any time, as far as snow is concerned.

The worst trouble has been one of ice control. Due to the light snowfall especially when it is a wet snow, traffic on the main highways compacts it into ice before removal is possible, and during many periods in the winter the temperature is such that rain or sleet freezes to the pavement immediately, and ice results. Of course an attempt is made to remove this snow or ice at once but there are many occasions when this is not possible by means of truck scrapers or graders, and other methods must be used.

Use of Calcium Chloride

As much as 15 years ago, we used plain calcium chloride on certain hills, curves and intersections when they became badly coated with ice. Naturally we paid the penalty, along with many other communities employing similar means, from the resulting scaling on our concrete pavements. It should be brought out that all scaling of concrete pavements has not been due to calcium chloride. The importance of clean and well-graded aggregate as well as over-finishing of concrete are matters of extreme importance in construction which time and experience had to prove to the engineer. Lack of this care, together with the use of calcium chloride for ice removal, has proved a very bad combination as can readily be seen on many of our older pavements.

The next step was the use of calcium chloride mixed with sand, often just prior to application. This also proved inefficient, inasmuch as during extra cold weather the chloride did not go into solution quickly enough to hold the sand in place, so it was found advisable to prepare the sand and chloride in advance. This has the double advantage of preventing the sand from freezing and providing easier manipulation, together with keeping the sand in place after application. On steep grades where there was usually trouble, storage boxes were erected containing a yard or more of treated sand where the motorist might give himself first aid prior to the arrival of the county forces. These boxes are still maintained at certain points, although in recent years they have been used very little as people seem to prefer to wait in their cars for the arrival of the sand trucks.

Present Methods of Ice Control

Up to 4 years ago, an attempt was made to take care of only the worst locations and conditions, but then it was decided that it was worth while on all pavements, since they are virtually all main roads between villages and cities throughout the county, so the entire 300 miles of pavement, practically all concrete, was placed on the ice-control program.

Late in the fall, just prior to freezing, when the sand and gravel pits are generally moist from the fall rains, we prepare approximately 1,000 yards of sand by screening over a ¼-inch mesh and mixing with calcium chloride. A clean, sharp sand is desirable and we prefer one which would be considered too coarse for concrete work. Part of this material is hauled to the central garage and the balance left in the pits. We try to use only enough chloride to prevent freezing of the stockpiles, with additional chloride spread over the surface of the stockpiles at times. During the winter of 1937-38, the proportion of calcium chloride to sand was 0.44 sacks per cubic yard as applied to the road. As occasion demands, additional stockpiles are prepared during the winter so that there is always enough material on hand to take care of at least two ice storms.

Frequently ice trouble occurs only in part of the county so it is essential that prompt reports be made to the central garage when a storm arises. The county's central garage is open at all times and, in cases of night storms, the men are called out and operations started immediately. Fortunately, there are a number of men available who live near the garage, so that little time is lost in getting started. The first loads are taken from the central garage and then, in case of a general storm, the trucks return directly to the nearest pits for succeeding loads. Full control is maintained in the central garage so that the entire force may be directed to specific areas if necessary.

At certain intersections, excessive

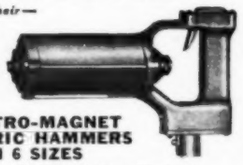
(Concluded on next page)

THE YEARS HAVE PROVEN *The Dependability of*

SYNTRON ELECTRIC TOOLS

as well as their—

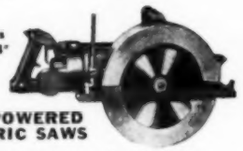
MONEY SAVING ABILITY!



ELECTRO-MAGNET ELECTRIC HAMMERS IN 6 SIZES

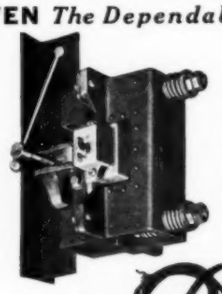
For Drilling—Cutting—Surfacing Concrete—For Vibrating Forms—For Pointing Brick—and for a dozen other jobs.

In 5 Models —2" to 4 3/4" Cuts



OVERPOWERED ELECTRIC SAWS

With tilting bases for bevel cuts. Also with abrasive discs for tile, etc.



EXTERNAL CONCRETE VIBRATORS (Electric)

For Wall Forms—Tunnel Linings—and Precast Products—Pipe, etc.

INTERNAL CONCRETE VIBRATORS

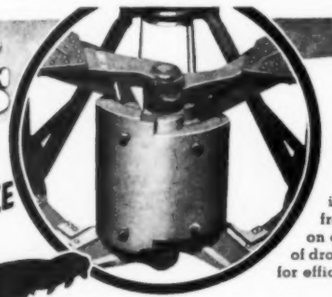
Both Electric Motor and Gas Engine Driven, 6500 to 9000 V.P.M.

Write for Complete Catalog

SYNTRON CO. 500 No. Lexington Ave., Homer City, Pa.

Or Ask Your Equipment Distributor

Owen Buckets RENDER LONGER SERVICE



A MOUTHFUL AT EVERY BITE

DROPPING SHOCKS *Absorbed by—*

unique Owen patented stops — four heavy reinforced lugs, cast integral with and extending from each hinge casting—slipping action of lugs on curvature of counterweight absorbs most severe of dropping shocks—holds bucket in correct position for efficient digging.

THE OWEN BUCKET CO.

6030 BREAKWATER AVE., CLEVELAND, OHIO

BRANCHES: New York, Philadelphia, Chicago, Berkeley, Cal.

ON THE SPOT...

3/8YD 1/2YD

Single axle — Dual-Tandem Drive — Four-Wheel Drive. All quickly convert to Shovel, Crane, Clam, Dragline, Trench Hoe. Built by AMERICA'S TRUCK SHOVEL SPECIALISTS

Does heavy cumbersome equipment put YOU "on the spot" when competition is keen? Then put a **MICHIGAN** TRUCK SHOVEL - CRANE **on the spot** when and where you choose, and watch it earn neat profits from jobs formerly worked at a loss!.. Here's how MICHIGAN does it-- 1. High daily yardage --air controls (no operator fatigue)... 2. High speed from job to job at minimum cost... 3. Downright mechanical dependability! Profit by investing in a MICHIGAN TRUCK SHOVEL - CRANE

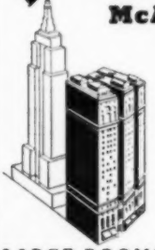
Write for Work Book C109

MICHIGAN POWER SHOVEL CO

Benton Harbor, Michigan, U. S. A.

IN NEW YORK

HOTEL McALPIN



"A GREAT HOTEL"

LARGE ROOMS, NEWLY FURNISHED & DECORATED

SINGLE from **$3.00**

DOUBLE from **$4.50**

1 BLOCK FROM PENN. STATION

B. & O. Motor Coaches stop at our door.

A FAVORITE WITH CONTRACTORS AND ENGINEERS

HOTEL McALPIN

BROADWAY AT 34th ST., NEW YORK

Under KNOTT Mgt. John J. Woelfle, Mgr.

Genesee County Solves Ice Control Problem

(Continued from preceding page)

grades and other locations, we may always expect trouble during any storm. To these places smaller trucks are dispatched at once from the garage to supplement the regular sanding. We are attempting at these locations to use more sand with less proportion of chloride and in a few instances are able to use untreated sand. However, in case of low temperatures and strong wind, it is necessary to use treated sand to prevent its being blown or swept off the surface by traffic. There are storms where we must repeat operations, because of these conditions, and the same thing applies to continued storms.

Equipment Used

For distributing the sand on the highways, the county has four 8-yard semi-trailers, twenty-one 3-yard dump trucks and fourteen centrifugal sand spreaders. In addition there is the loading equipment consisting of cranes and bucket loaders. We have found the 8-yard semi-trailers especially effective for this type of work and get them under way as soon as possible. There are times when as little as 3/8-yard to a mile of 20-foot pavement is sufficient, although the average amount used is nearer to 1/2-yard per mile, and the use of the trailers makes for efficient distribution as well as maximum speed. In distributing the sand, a speed of 15 to 18 miles an hour is usually maintained, and in the case of the trailers, the box is not held at its maximum dumping pitch; instead the unit is stopped two or three times during the delivery of the load, the dump box raised to move the sand to the rear, and then lowered part way.

The value of this type of equipment for sanding can not be overemphasized. The rear corners of the truck body are chamfered off to confine the flow of gravel to the opening at or near the rear-end gate, and also to provide a standing place in the corners for two men, equipped with shovels, to feed the sand uniformly to the spreader. We also have built a railing around the rear half of the truck bodies further to protect the men. We much prefer to keep the men on the trucks while regulating the flow of sand rather than on the sander itself, due to the danger of collisions.

The type of sand spreader which we use and which we consider very satisfactory was developed by our mechanics in our own shops. Several years ago we copied a type which Wayne County was using, consisting of rear axles of old Fords with the pinion shaft in a vertical position to operate the disk. We were not satisfied with the height necessitated by this type of spreader and began building a one-wheel spreader. This consists of a single-wheel industrial-type 400 x 8 pneumatic wheel mounted well forward under the hopper to obtain maximum traction. The hopper is cone shaped, approximately 18 inches in diameter at the top, 9 inches at the bottom and 7 inches high. At the bottom of the hopper there are three plates, two fastened and one movable, held together by spring tension bolts, allowing the delivery of sand to the spinner plate to be controlled at will, both as to quantity and location. The location of the sand on the spinner plate is very important in controlling the direction of the spread. Sand may thus be spread entirely to the right or to the left of the machine or to any intermediate position. The sander is driven by a 7-inch V-type pulley mounted on the driving wheel to a similar pulley mounted on the gear-box shaft. The gear box contains two bevel gears taken from a standard patrol-grader lower power take-off. The spinner plate on which the sand drops from the hopper is mounted on the gear-box shaft which extends into the hopper, forming an agitator to prevent the sand from coning or arching. Attached to the shaft are two plates which have a tendency to feed the sand downward on to the plate. The speed of this plate is 350 rpm at a 15-mile per hour truck speed. The sander, which weighs approximately 240 pounds, is easily attached to the rear end of a truck and is changed quickly on the road so that each truck does not require an individual sander.

Ice Removal Costs

During the winter of 1937-38, we spent $19,978.00 for sanding and ice removal on 300 miles of pavement. The costs are not separable but it is estimated that the cost of sanding, including processing, was approximately $3.00 per cubic yard. During that winter 1,658 sacks of calcium chloride mixed with 3,769 cubic yards of sand was used to sand parts or all of the county system for forty-four storms, seven of which occurred on November, fifteen in December, twelve in January, eight in February and two in March.

We believe that the money was well expended and we know that the public is sold on this type of work. We do have accidents, however, caused by reckless drivers who seem to think that if the road is sanded they can maintain summer traffic speeds, rather than feeling that sanding is an aid to safer winter driving conditions.

Improvements can and will be made further to expedite sanding, as its usefulness depends largely on the speed of operation. It seems wholly possible that better means could be evolved through the weather bureau by receiving warning of advancing storms. Even an hour's notice would aid materially in preparation for an emergency. More equipment, better location of stockpiles, and larger organizations are economic questions which must be solved in each individual community, but the demands of the public are clearly for a closer approach to the fire-patrol type of service in ice control on our highways.

Needless to say, the success of this work depends on an efficient and loyal organization and much credit must go to the men who are called upon, either day or night, to work under the most adverse weather conditions.

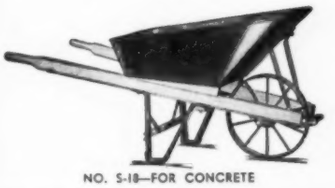
From a paper presented before the Twenty-Fifth Annual Highway Conference at the University of Michigan, February, 1939.

"Roads Rule the World" will be the theme of the 1940 A.R.B.A. Convention and Road Show to be held in Chicago next January. Among the topics to be discussed will be the part roads will play in national and international peace, prosperity and progress.

STERLING BALANCED WHEELBARROWS

GREATER PART OF LOAD BALANCED OVER WHEEL. LESS THAN 20% ON ARMS.

NO. S-12—FOR DRY MATERIALS



NO. S-18—FOR CONCRETE

A COMPLETE LINE OF STERLING WHEELBARROWS AND CONCRETE CARTS.

STERLING WHEELBARROW CO., MILWAUKEE, WIS.

LA CROSSE Heavy Duty TRAILERS

The most complete line on the market. Capacities, five to two hundred tons. Four to sixteen wheels. Two to eight axles. They are built to take the heaviest loads safely, and with the least damage to road beds. Write today. Just tell us what you have to move.

THE LARGEST TRAILER IN THE WORLD IS A LA CROSSE!

LA CROSSE TRAILER & EQUIPMENT CO., LA CROSSE, WIS., U. S. A.

DIVISION OF LA CROSSE BOILER CO.

New operating efficiency means SAVINGS and PROFITS for You... with

HEIL DIG-N-CARRY HYDRAULIC SCRAPERS

The *split-second hydraulic finger-tip control* of Heil Dig-N-Carry Scrapers insures accurate cutting and spreading in quick, profit-building time. You eliminate "washboard" digging . . . enjoy clean-cut work that brings repeat business. ● Famous Heil husky construction provides the "guts" your scrapers need to see jobs through on time — at savings in service expense — regardless of conditions. You can bid low enough to get the good jobs — yet *make money.* ● Equip yourself for profits, with Heil Dig-N-Carry Hydraulic Scrapers . . . Write today for free Heil Equipment Catalog showing complete line of scrapers and dump units.

HEIL QUALITY PRODUCTS—
Hoists — Bodies — Road Scrapers — Transportation Tanks — Dehydrators Heating Equipment — Water Systems Bottle Washers.

HEIL Quality PRODUCTS

THE HEIL CO.

MILWAUKEE, WISCONSIN HILLSIDE, NEW JERSEY

County Airport On Mountain Top

Wheeling-Ohio County, W.Va. Airport Located on Site Accessible from City and Safe from Floods

By GLEN T. LOWE

✦ OHIO County and Wheeling, West Virginia, the county seat, decided to have an airport if they had to build it atop one of their mountains, which is just what they did. The best available location for an airport, with satisfactory access to the city, and one not excessive in cost and safe from floods was found to be on top of a mountain, about 10 miles north of Wheeling. The site selected is about 1½ miles east of the Ohio River and about 500 feet above it, well above the damaging floods of the river. The airport is so located that the air lane of TWA from Pittsburgh to Columbus passes directly over it.

The site had been used for farming and grazing and was, therefore, cleared of trees. The terrain was rolling, not too gently, and the problem was to cut down the high places and fill in the valleys or hollows. This presented quite a problem; for the east end of Runway B the excavation began at about Elevation 1,295 and was hauled into the fill about the middle of the runway at about Elevation 1,110. The project was designed for three runways 500 feet wide, with 100-foot paving, one 3,700 feet long and the other two 3,200 feet in length.

The Wheeling Chamber of Commerce and the Ohio County Commissioners sponsored the airport as a WPA project and claim it to be the second largest project of its type to be constructed. All of the work was done by WPA labor except 1,000,000 cubic yards of unclassified excavation for Runway B which was let to the Keeley Construction Co., of Clarksburg, W. Va., with the stipulation that the contractor have the option of contracting for the remaining 1,969,451 yards at the same unit price.

The estimated quantities were:

Item	Quantity
Unclassified excavation	2,969,451 cubic yards
Structure excavation	6,357 cubic yards
Knapped-stone base	33,180 cubic yards
Pipe drains, 6, 8, 10 and 12-in.-h	10,620 linear feet
Broken stone for underdrains	4,500 cubic yards
Class B concrete	625 cubic yards
Bituminous surfacing	120,456 square yards
Cemented stone gutter	1,200 cubic yards

The profile of the ground along the center line of Runway B is high on either end, dipping toward the center. The logical method of construction was to begin cutting the ends and filling in the middle. The WPA forces cut the ditches for the French drains ahead of the filling-in operations. A ledge of stone was uncovered on the west end and this stone was stockpiled for the base stone and surface metal of the finished runways.

The Keeley Contract

By using heavy-duty efficient equipment directed by competent foremen, the Keeley Construction Co. took the top off the peaks at the rate of about 150,000 cubic yards a month. To maintain this schedule, the contractor purchased some new equipment. On the east end of Runway B a Northwest 80-D diesel shovel kept four 12-yard Euclid Trac-Truks busy on a 1,500-foot haul. Most of this haul was down grade, ranging from 10 to 12 per cent. In addition, on this same end of the runway, two Caterpillar Seventy-Five tractors, each with a 12-yard LeTourneau Carryall, were used. One stripped the sod and top soil and stockpiled it for later use in finishing the runways and around the hangars and parking facilities. The other cut shale along the haulways of the Euclids and filled in the low places to make the going easier.

On the west end of the runway, where the cut was not so heavy, a 1½-yard Northwest did its bit to keep the material moving. The hauling units for this shovel were three Caterpillar Seventy-Five tractors, each pulling two 8-yard Athey wagons in tandem, and two 3-yard trucks.

Personnel

John P. Keeley, Jr., was Superintendent for the Keeley Construction Co., assisted by John Cain and Sam Polino. The designing and construction engineers for the Wheeling-Ohio County Airport were C. C. Smith's Sons of Wheeling.

Handy for All Types of

PAINT SPRAYING JOBS

This all-purpose paint sprayer pays its way on a great variety of jobs. Ideal for painting bridges, park benches, stadia, traffic signs, etc. Marks street center lines, cross-walks, parking areas, etc. Gives year around service. For large or small cities. Hand propelled or power-driven units. LOW COST. Write for literature.

MEILI-BLUMBERG CORP.
Box C-10 New Holstein, Wis.

MEILI-BLUMBERG

A2550-B

RAIL CRANES SHOVELS DRAGLINES ZEE ROTATORS
BROWNING PRODUCTS
DIESEL GASOLINE STEAM ELECTRIC

BROWNING

has had no peer for 40 years

AT YOUR SERVICE FOR THESE PRODUCTS

THE BROWNING CRANE & SHOVEL CO.
Established 1899
Main Office and Factory 16226 Waterloo Rd., Cleveland, Ohio
Export Department 30 Church St., New York, U.S.A.

CRAWLER, TRUCK AND WAGON DRAGLINES SHOVELS CRANES - HOES
BROWNING PRODUCTS
DIESEL GASOLINE STEAM ELECTRIC

Gruen professional wristwatches up to engineering specifications!

● Because no ordinary wristwatch will do for the men who build America, Gruen master-craftsmen have designed the five smart timepieces shown on this page to *your* exacting specifications!

They're smartly handsome, yes—but their beauty is only part of their story! They're accurate as an engineer's wristwatch must be—with genuine Gruen movements that mean pocket-watch precision! Their dials are easy-to-read, with full-sweep second hands or separate "second dials" for really accurate split-second timing.

Shown on this page are five Gruen wristwatches specially designed for engineers. Ask your Gruen jeweler to show you others—visit him today and make your next watch a Gruen—America's choice since 1874! From $24.75 to $250; with precious stones, up to $2500. Write for folder. The Gruen Watch Company, Time Hill, Cincinnati, O., U. S. A. In Canada, Toronto, Ont.

Gruen
The PRECISION *Watch*

SEE THESE GRUEN PROFESSIONAL WATCHES TODAY . . . .

SKY CHIEF, 15 Jewel movement, yellow gold-filled case, Guildite back, $29.75.

VERI-THIN* INTERNE, 15 Jewel movement, yellow gold-filled case, Guildite back, $33.75.

OLYMPIAD, 17 Jewel movement, yellow gold-filled case, $37.50.

VERI-THIN* TECHNICIAN, 17-jewel Precision, yellow gold-filled case, Guildite back, $39.75.

BROADWAY, 17 Jewel movement, yellow gold-filled case, $42.50.

GIFTS FROM YOUR JEWELER ARE GIFTS AT THEIR BEST!

COPYRIGHT 1939, THE GRUEN WATCH CO
*REG. U. S. PAT. OFF. PATENTS PENDING

Phases of Road Work In Faribault County

(Continued from page 23)

ing trucks and equipment. Most of the overhauling is done in winter when there is not so much outside work. Work such as tuning up motors and repairs to machines at the outlying garages is done with assistance of local garagemen and mechanics.

The heavy equipment owned by the county and distributed between the various garages for better service to the roads includes: one Caterpillar Sixty tractor with a LaPlant-Choate V plow; four Coleman 4-wheel drive trucks with V plows and wings; two GMC 4-ton trucks with V plows and wings; one Caterpillar Thirty with V plow; one FWD truck with a Snogo rotary plow; two Caterpillar No. 11 Auto Patrols with V plows and wings; four Ford pick-up and dump trucks. Six of the trucks are equipped with St. Paul hydraulic underbody scrapers, and the V plows are divided between Wausau and Bros units.

Construction and Maintenance

The northwest and southwest sections of the county are lacking in satisfactory gravel pits so that gravel is shipped in and hauled distances as great as 23 miles. The construction of roads has been speeded considerably by the county board using the $70,000 of gas tax money to match town money for the improvement of county roads within the towns.

"When it snows it blows," remarked Mr. Quarve, paraphrasing the well-known salt advertisement, "When it rains it pours," so that it is practically impossible to plow snow with any degree of success until the storm is over. For this reason plowing in Faribault County is left entirely until snowfall has ceased. Then the plows start out from every one of the garages and the advantages of decentralization are apparent as they seem to reach the entire county road system at the same time.

Electric Drills Redesigned

Announcement has been made by the Black & Decker Mfg. Co., Towson, Md., that five of its line of portable electric drills have been redesigned. These improved drills, which include the ½-inch Utility, ⅜-inch Heavy Duty, ⅜-inch Utility, 5/16-inch Heavy Duty and ¼-inch Heavy Duty, are all shorter in length than their predecessors and on each the spindle offset has been reduced to a minimum.

In addition to being more compact, they have other new features, including threaded chuck mounting, splined mounting for the spindle gear, and removable commutator covers.

New Floodlight Unit Has Swivel Cover Glass

A new floodlight for use in lighting construction jobs, on equipment, at lubricating and repair stations and similar places has recently been announced by the Westinghouse Electric & Mfg. Co., Lighting Division, Cleveland, Ohio. A feature of this new light, which can accommodate 750, 1,000 or 1,500-watt lamps, is an optional cover glass that allows easy access and is swiveled at the top of the reflector. Three easily operated stainless-steel clamps hold the cover in place and a cast-aluminum hood insures weather-tight joining.

Maximum light output is provided by the use of vertical burning lamps and easily cleaned Alzak-processed aluminum reflectors. A wide range of beam spreads is possible through choices of a polished narrow-beam reflector or diffusing wide-beam reflector; plain or diffuse lens; and clear or inside frosted lamps. Both available lenses are of high-transmission heat-resisting glass. Skeleton mogul screw-base sockets are provided with nickel-plated metal parts and spring phosphur-bronze center lamp contact.

The construction of the reflector base and bracket permits wiring without handling the reflector which can be removed and reinstalled without the necessity of refocusing. A cast-aluminum socket extension is attached to the reflector by four heavy bolts and makes a weather-tight seal.

The only way to insure the use of gasoline and motor vehicle taxes for the purpose for which they are intended, our roads, is to make diversion of such funds unconstitutional.

ROSS BURCH BUILT SNOW PLOWS

A model for every snow removal problem—"One-way"—"V" types—Reversible and Non-Reversible—Sidewalk plows and every type of Wing attachment. For light and heavy duty trucks and tractors (wheel or crawler type).

WRITE FOR CATALOG AND PRICES!

BURCH CHIP-IT-OVER

Saves money and material both Summer and Winter. Use for sanding icy roads and streets or for seal coating and re-surfacing. Independent motor controls width and depth of spread.

WRITE FOR LITERATURE AND PRICES!

THE BURCH CORP.
CRESTLINE, OHIO

Engineering Facts about UNION METAL Tapered Monotube Steel Piles

1. GREATER PILE LOADS NOW POSSIBLE
Long, tapered Monotube Steel Piles can be driven to greater depths in high load-sustaining soils, then filled with concrete, to develop load supporting values of 60 tons or more with ample factor of safety.

2. SUBSTRUCTURES OF ASSURED RESULTS
After driving, these sturdy, heavy gauge, Monotube Steel Piles can be inspected to the very toe before filling with concrete, giving visual proof to the engineer of the integrity and axial accuracy of the substructure he has designed.

3. ADAPTABLE TO VARYING CONDITIONS
Monotube Steel Piles of varying gauges, tapers and lengths are available to meet difficult and varying soil conditions. Prompt deliveries on all types.

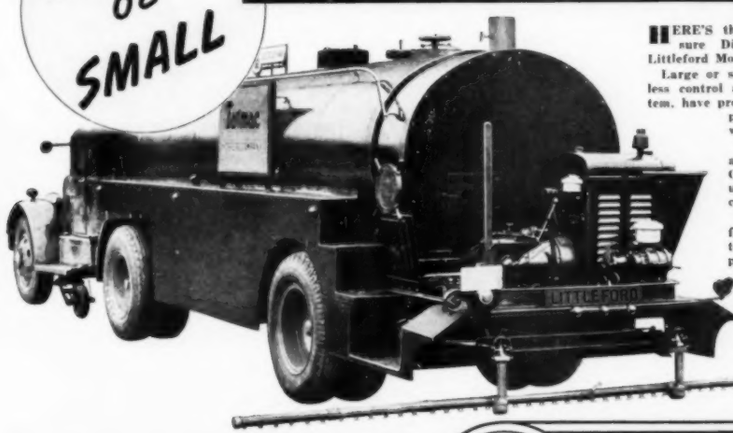
4. ECONOMICAL
Easier handling, lighter field equipment, speedier driving have all contributed their share of savings to make this *superior* pile available to you and your client at no greater cost.

Write today for a copy of Union Metal Catalog No. 68 for complete data on Monotube Piles.

THE UNION METAL MANUFACTURING CO.
CANTON, OHIO

LARGE or SMALL

THEY OPERATE EFFICIENTLY



HERE'S the most modern and efficient Pressure Distributor designed today—it's the Littleford Model "C."

Large or small, the ease of operation, gadgetless control action, and the fastest heating system, have proved to be the features Highway Departments and Contractors have been waiting for.

Model "C" makes it easy to heat and apply Tar, Asphalt, Road Oils, Cutback, or Emulsions, on spray bars up to 24 ft. The suck back principle gives the real no-drip action.

Compare this Model "C" feature for feature with other Pressure Distributors. You will see why it's superior. Write for prices and details.

Model "C"

Above Model "C" Pressure Distributor is a 3000 gallon capacity, Semi-Trailer Unit, with 24 ft. Suck Back Spray Bar

LB LITTLEFORD
BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE 1900

LITTLEFORD BROS.
485 E. Pearl St. Cincinnati, Ohio

HOTEL CHELSEA
RIGHT ON THE BOARDWALK

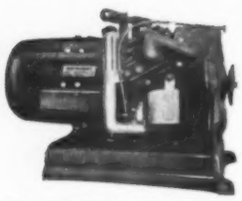
For Recreation Or Relaxation Choose the Chelsea

FROM $6 WITH MEALS & BATH
$3 ROOM ONLY & BATH Per Person 2 in a Room

Here you will find everything to further your comfort and enjoyment—outside ocean-view rooms . . . sun deck . . . beautiful dining room at the ocean's edge . . . superb cuisine . . . varied sports . . . and entertainment. You'll like your fellow guests . . . and the delightfully friendly atmosphere of The Chelsea.

SPECIAL WEEKLY RATES

ATLANTIC CITY
JOS. HILLMAN • J. CHRISTIAN MYERS • JULIAN A. HILLMAN



The Katolight 19A Electric Lighting Plant

New Lighting Unit Is Quiet, Portable

The new Katolight Quietlight Model 19A portable lighting unit, recently announced by the Kato Engineering Co., 530 No. Front St., Mankato, Minn., has a full-load capacity of 350 watts 110 volts alternating current or 200 watts of 6 volts direct current. It is designed for quiet, continuous operation of 5 to 10 hours and is particularly suitable for lights on equipment, lighting a job at night, or for use in a contractor's field office or repair shop.

The Model 19A is self-cranking from one 6-volt auto battery and is equipped with starting switch, reverse current relay, ammeter, and battery charge control resistor. The unit is mounted on sponge rubber pads and need not be bolted down. A cast aluminum fuel tank has a capacity of one gallon, enough for approximately 10 hours of operation under full load. The unit is equipped with a special Kato four-pole heavy-duty generator, with a steel frame, bolted directly to the engine crankcase. It has grease sealed ball bearings and is equipped with four heavy-duty dc brushes, with both dc and ac brushes on the outer end of the generator for easy accessibility. The engine is a Johnson Iron-Horse 5⅛-hp single-cylinder four-cycle air-cooled unit with 2⅛-inch bore and 1¾-inch stroke.

Literature describing the Model 19A lighting unit, which is equipped with carrying handles for easy portability, may be secured by those interested direct from the manufacturer or from this magazine.

Modern Road Equipment

Two new folders describing the line of modern construction tools for all types of dirt-moving and highway grading jobs made by R. G. LeTourneau, Inc., Peoria, Ill., and Stockton, Calif., have just been issued by that company.

The 12-page general construction folder deals with the entire line, including bulldozers, Carryall scrapers, sheepsfoot rollers, Rooters, tractor cranes and power control units. Job photographs show this equipment in use on different types of jobs and under varied job conditions. The second folder, of particular interest to state and county highway engineers and road contractors, shows LeTourneau bulldozers, Carryalls and Rooters handling highway maintenance and construction jobs from the initial cuts to the finished grade.

Copies of these two new LeTourneau folders may be secured direct from the manufacturer or from CONTRACTORS AND ENGINEERS MONTHLY.

Petroleum Industry Facts and Figures

The Sixth Edition of "Petroleum Facts and Figures" prepared by the American Petroleum Institute and presenting a statistical and factual picture of the operations and services of the industry has just been published. This new 192-page edition supplements, rather than supplants, the Fifth Edition published in 1937 and contains considerable new data, in addition to revised tables and material.

This handbook covers such subjects as the utilization of petroleum products, production, refining, transportation, marketing, prices and taxation, general information, and directories of petroleum and allied associations.

Copies of "Petroleum Facts and Figures" may be secured from the American Petroleum Institute, 50 West 50th Street, New York City. Price: $1.00.

New Catalog on Barrows, Concrete Carts, Heaters

The Jackson Mfg. Co., Harrisburg, Penna., manufacturer of wheelbarrows, drag scrapers, salamanders, mortar pans and mortar mixing boxes, has recently issued a new catalog describing and illustrating these products. Its line of contractors' wheelbarrows includes wood-frame and all-steel-frame deep types for wet materials, narrow large-capacity barrows, narrow front types for pouring, stone barrows and various other types with pneumatic-tired wheels. Jackson pressed-steel drag scrapers are manufactured in three weights, standard, extra heavy and light weight, and in three capacities.

Details of construction and other pertinent data on these pieces of equipment are contained in this Catalog No. 40, copies of which may be secured by those interested direct from the manufacturer by mentioning CONTRACTORS AND ENGINEERS MONTHLY.

Concrete Form Board

The Masonite Corp., 111 W. Washington St., Chicago, Ill., has recently issued a very complete and informative booklet on Masonite Tempered Presdwood concrete form board which, according to the manufacturer, is much denser, less absorptive and of considerable greater structural strength than previously made board. Details of the manufacture of Presdwood, its physical characteristics and adaptability are presented, and specifications are given. The catalog is profusely illustrated with photographs and drawings, and there are two deflection charts with a typical example for their use. Copies of this catalog may be secured by writing direct to the manufacturer and mentioning this magazine.

USE RIGHT BUCKET FOR THE JOB

Hayward makes all four—clam shell, dragline, electric motor, orange peel. A Hayward recommendation is unprejudiced.

THE HAYWARD CO., 32-36 Dey St., New York

Hayward Buckets

MIX MORE CONCRETE—MAKE MORE MONEY on Small jobs!

This new catalog on the Rex 3½-S Tilter tells you why this half-bag mixer will pay off in profits on small jobs or in mixing concrete for odd jobs on larger projects! It tells you about the exclusive Rex features:

The Rex self-leveling front foot, adjustable to any incline. *The Rex positive-acting drum lock* for faster drum spotting—charge and discharge. *The three Rex "hollow bar"* mixing blades that mean a faster mix of a better batch.

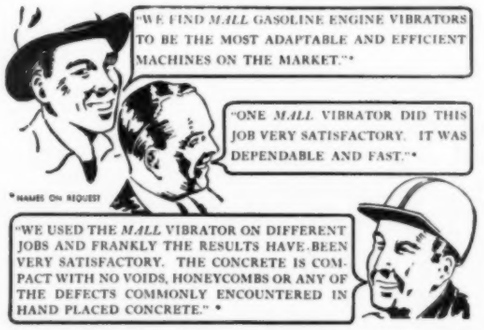
Get your copy now and see the whole story of the "Rex-clusive" advantages. Address the

CHAIN BELT COMPANY
1679 W. Bruce St. Milwaukee, Wis

SEND FOR THIS BOOK

REX MIXERS

READ WHAT USERS SAY ABOUT *Mall* TRADE MARK VIBRATORS

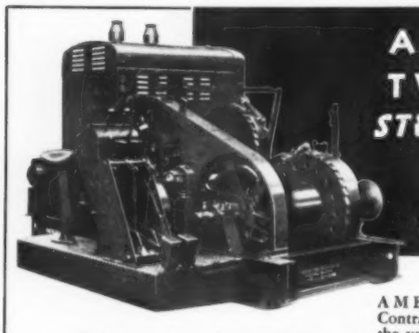

"WE FIND MALL GASOLINE ENGINE VIBRATORS TO BE THE MOST ADAPTABLE AND EFFICIENT MACHINES ON THE MARKET."*
"ONE MALL VIBRATOR DID THIS JOB VERY SATISFACTORY. IT WAS DEPENDABLE AND FAST."*
*NAMES ON REQUEST
"WE USED THE MALL VIBRATOR ON DIFFERENT JOBS AND FRANKLY THE RESULTS HAVE BEEN VERY SATISFACTORY. THE CONCRETE IS COMPACT WITH NO VOIDS, HONEYCOMBS OR ANY OF THE DEFECTS COMMONLY ENCOUNTERED IN HAND PLACED CONCRETE." *

You, too, can have better quality concrete at lower costs by using DEPENDABLE MALL concrete vibrators. There's a type and size—gasoline engine, air, or electric—for every construction job.

In addition to concrete vibrating, MALL power units can be used for CONCRETE SURFACING, PUMPING, SAWING, DRILLING IN WOOD, BRICK, CONCRETE OR STEEL, SANDING AND GRINDING.

There is no guesswork with MALL tools. Investigate today! Send for full particulars. No cost or obligation.

MALL TOOL COMPANY
7743 South Chicago Avenue, Chicago, Illinois
OFFICES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES



AMERICAN TWO SPEED STEEL ERECTION HOISTS
THE UTMOST IN SPEED and EFFICIENCY

AMERICAN Air-Controlled Contracting Band Frictions and the very last word in ultra-modern hoist design and construction all the way through. These great Hoists were planned and built to give one hundred per cent service on present day "High Pressure" jobs, where rising costs must be countered with more speed, more power, greater ease and flexibility of operation, and the ruggedness which insures continued prosecution of the work. Positive protection against dropped loads due to operator or power failure. Line pulls and speeds to fit all job requirements.

Write today for Catalog 100-H-3

The Genuine CROSBY CLIP

AMERICAN HOIST & DERRICK CO.
NEW YORK ST. PAUL CHICAGO
AMERICAN TERRY DERRICK COMPANY
SOUTH KEARNY, N. J.

HOIST BUILDERS SINCE 1883

CONTRACTORS AND ENGINEERS MONTHLY
470 Fourth Avenue, New York
Enclosed is my remittance of $2 for the next twelve issues of CONTRACTORS AND ENGINEERS MONTHLY

Name_____

Position_____
(Or Type of Business)

Address_____

(City)_____

N.B. A two dollar bill, check or postage stamps will be entirely acceptable.

Second Edition of Handbook On Wood Structural Design

The second edition of "Wood Structural Design Data," Volume I, a 296-page handbook of technical information incorporating recent research findings on wood, with design data arranged for the convenience of engineers, architects and students, has recently been announced.

Revised by two members of the National Lumber Manufacturers Association technical staff, the handbook contains information on the physical, chemical and mechanical properties of wood, timber quality-strength relations, a glossary of lumber terms, charts and tables.

The following supplements to the volume contain additional technical information useful in wood design: Supplement No. 1, Working Stresses for Structural Lumber; No. 2, Bolted Wood Joints—Safe Loads on Common Bolts: No. 3, Maximum Spans for Joists and Rafters; No. 4, Wood Columns—Safe Loads; and No. 5, Wood Trusses—Stress Coefficients, Length Coefficients and Angles.

Copies of "Wood Structural Design Data" may be secured from the National Lumber Manufacturers Association, 1337 Connecticut Ave., Washington, D. C. The price of Volume I alone is $1.00 and with the supplements, $1.25.

Want any information on equipment? Write the Editor.

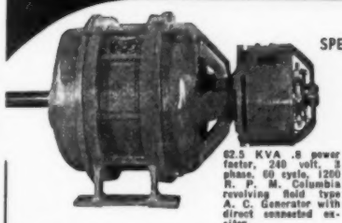
For Sale or Trade

2—18-20-yd. LeTourneau Carry-all Scrapers, excellent condition. With or without Caterpillar RD8 Tractors. Or will trade for smaller tractors and scrapers.

CHADWICK MACHINERY CO.
San Antonio Texas

Aeroil OIL BURNING CONTRACTORS' EQUIPMENT
• KETTLES FOR TAR, PITCH & ASPHALT • EMULSION DISTRIBUTORS • POWER SPRAYS • LEAD MELTING FURNACES • WEED BURNERS • TORCHES & BURNERS
Send for *FREE* Bulletin No. 100-C
Aeroil Burner Co., Inc.
West New York, New Jersey
Chicago San Francisco Dallas

COLUMBIA A. C. GENERATORS



62.5 KVA .8 power factor, 240 volt, 3 phase, 60 cycle, 1200 R. P. M. Columbia revolving field type A. C. Generator with direct connected exciter.

SIZES: 1 to 300 KVA.
SPEEDS: 1800, 1200, 900, 720, 600, 514, 450 R.P.M.
SHIPMENT: ONE WEEK TO 10 DAYS.

Driven by Diesel or gas engine, Columbia Generators furnish power and light where current is not available and are also used for stand-by service in event of power failure. Compactly built, they are easily portable. Write for bulletin describing their dependable construction.

COLUMBIA ELECTRIC MFG. CO. 4510 Hamilton Ave., Cleveland, Ohio

Directory of EQUIPMENT DISTRIBUTORS

The following cards (arranged by states) show the names of dealers in contractors' equipment and supplies, with a record of various lines handled.

ARIZONA TRACTOR & EQUIP. CO.

1402 North 19th Ave., P. O. Box 1494,
Phone 3-1146, Phoenix, Ariz.

Representing

AEROIL Products
AIRCO Distributors, Bull-dozers, Tamping Rollers, Scarifiers
BROOKVILLE Locomotives
BROS Bull-dozers, Angle-Dozers, Snow Plows
BUCYRUS-ERIE Shovels
BUFFALO-SPRINGFIELD Rollers
CLETRAC Tractors
CLEVELAND Rock Drills
EAGLE Crushers
EMSCO Road Equipment
GAR WOOD (Isaacson)
KEWANEE Conveyors
SCHRAMM Compressors
SOUTHWEST WELDING & MFG. CO.
SULLIVAN MACHY. CO.
WHITE & INDIANA Trucks

Member: Associated Equipment Distributors

GARLINGHOUSE BROS.

2416 E. 16th St. Los Angeles, Calif.

Southern California Distributors for

BROWNING—Truck Cranes, Shovels, Locomotive Cranes
LEMPSTER—Dumpsters
DIAMOND IRON WORKS—Crushers, Portable Gravel plants
LAMBERT-NATIONAL—Hoists and Cableways
McKIERNAN-TERRY CORP.—Pile Hammers
A. LESCHEN & SONS—Wire Rope
NOVO—Engines, Pumps, etc.
OMAHA—Dragline Buckets
OWEN—Clamshell Buckets
RANSOME—Concrete Mixers, Pavers, etc.
UNIVERSAL—Panel Forms, Form Clamps, etc.

Manufacturers of

GAR-BRO—Concrete Carts, Wheelbarrows, Concrete Hoppers, Buckets, etc.
GAP-BRO—Dragveyor Attachment for Draglines

Member: Associated Equipment Distributors

EDWARD R. BACON CO., INC.

Folsom at 17th St.
San Francisco

Aeroil Emulsion Distrs.
Allis-Chalmers Tractors
American Concrete Grinders
Brooks Load Luggers
Byers Shovels, Cranes
Carlson Bit Grinders
Cleveland Rock Drills
Cleveland Trenchers
Dobbie Derricks, Fittings
Erie Rollers
Hercules Chip Spreaders
Hercules Power Units
Hough Sweepers
Huber Rollers
Interstate Tramways
Jackson Concrete Vibrators
Jaeger Mixers, Pumps, Hoists, Paving Equip.
Johnson Bins, Batchers
Jones Saw Benches
Littleford Wheeled Rollers
M-B Street Markers
McKiernan-Terry Pile Hammers
Marion Shovels, Cranes, Draglines
Nelson Bucket Loaders
Ohio Locomotive Cranes
Page Dragline Buckets
Porta Conveyors
Ramsey Winches
Schramm Air Compressors
Symons Cone Crushers, Vibrating Screens
Toledo Torches
Walter Motor Trucks
Wiard Plows
Winslow Scales

Member: Associated Equipment Distributors

NORRIS K. DAVIS, INC.

400 Seventh St. San Francisco, Calif.

Representing

CONSTRUCTION EQ. CO.—Marvel Tractor Excavators, Hoists, Loaders, Shovels
CONSTRUCTION MACHY. CO.—Wonder Mixers, Hoists
DAVIS COMPANY—Large Tilting Mixers, 1, 2, 3, and 4-yd., Weigh Batchers, Batching Plants, Manual or Full Automatic Operation, Readymix Concrete Plants and Equipment, Motor Truck Concrete Mixers and Carriers, Electrically Operated and Controlled Water Meters, Bins, Hoppers, etc.
HANSON CLUTCH & MACHY. CO.—Full Revolving Shovels, Cranes, Draglines, ⅜, ½, ⅝, and ¾-yd.
LE ROI CO.—Gasoline Power Units and Parts
MINN. STL. & MACHY. CO.—Twin City Engines, parts
NORTHERN CONVEYOR CO.—Stationary & Portable Conveyor Units
O. K. CLUTCH & MACHY. CO.—Hoists & Compressors
SNOW REMOVAL EQ. CO.—Rotoblade & Sierra Snow Plows

LLEWELLYN MACH. CORP.

1030 N. Miami Ave., Miami, Florida

Amer. Saw Mill Machy. Co.
Ames Baldwin Wyoming Co.
Anchor Concr. Machy. Co.
Atlas Imp. Diesel Eng. Co.
Austin-Western Rd. Machy. Co.
Barber-Greene Co.
Blystone Mfg. Co.
Browning Mfg. Co., Inc.
Climax Engrg. Co.
Century Electric Co.
Coffing Hoist Co.
Coldwell Lawn Mower Co.
Henry Disston & Sons, Inc.
Elkhart Rubber Works
Forest City Bit & Tool Co.
Gallameyer & Livingston Co.
Goulds Pumps, Inc.
Hercules Motor Corp.
Hewitt Rubber Corp.
Independent Pneu. Tool Co.
Ingersoll-Rand Co.
Jaeger Machine Co.
Edw. E. Johnson, Inc.
LeRoi Co.
Link-Belt Co.
Master Vibrator Co.
F. E. Myers & Bros. Co.
Novo Engine Co.
Northwest Engrg. Co.
Ohio Pattern Wks. & Fdy. Co.
Owen Bucket Co.
Page Engrg. Co.
Penn. Elec. Switch Co.
Pomona Pump Co.
Porter Cable Mach. Co.
Roberts Filter Mfg. Co.
Servel, Inc.
Stover Mfg. & Engine Co.
Syntron Co.
Viking Pump Co.
Wall Rope Works, Inc.
Westinghouse Elec. Supply Co.
Whitehead Bros. Rubber Co.
Wickwire Spencer Steel Corp.
Wisconsin Motor Co.

R. S. ARMSTRONG & BRO. CO.

676 Marietta St. Atlanta, Ga.

Representing

ALLIS-CHALMERS Power Units
BEEBE Hand Hoists
BROS Pneu. Tamping Rollers, Car Heaters
BUCYRUS-ERIE Cranes, Shovels
BURCH Unloaders, Conveyors
CARBIC Lights
CHICAGO PNEUMATIC Air Compressors
CRUSCA Drill Steel
HELTZEL Paving Forms, Bins, Batchers
JAEGER Concrete Mixers, Pumps, Paving Machy.
JONES-SUPERIOR Saw Rigs
LE ROI Engines
OWEN Buckets
ROEBLING Cable
ROSCO Distributors
SASGEN Derricks and Winches
TRAYLOR Rock Crushers
UNIVERSAL Rock Crushers

Member: Associated Equipment Distributors

TRACTOR & MACHINERY CO., INC.

351 Whitehall St., S.W., Atlanta, Ga.

Representing

CHAMPION Rock Crushers
HAISS Clamshell Buckets
JAHN Heavy-Duty Trailers
NORTHWEST Cranes, Shovels and Draglines
NOVO Engines, Pumps and Hoists
RANSOME Concrete Mixers
WORTHINGTON Air Compressors

Member: Associated Equipment Distributors

YANCEY BROTHERS, INC.

634 Whitehall St., SW,
Atlanta, Ga.

American Manganese Jaws
American Cable Wire Rope
Barber-Greene Ditchers, Conveyors, Asphalt Equipment
Barnes Pumps
Buffalo-Springfield Rollers
"Caterpillar" Tractors, Graders, Power Units, etc.
Cedar Rapids Crushers
Clyde Hoists
Connery Kettles, Tools
D-A Lubricant & RPM Oil
Davey Compressors
Dempster Quarry Skips
Durex Saw Rigs
Heater & Athens Plows
Ingersoll-Rand Air Compressors, Air Tools
Jackson Vibrators
Johnson Bins, Batchers, Bulk Cement Plants
Kitselaer Rippers, Harrows, Drag Scrapers, Plows
Kinney Asphalt Distributors
LaPlant-Choate Bulldozers, Trailbuilders, Tamping Rollers
LeTourneau Carry-all Scrapers, Angledozers, Bimpacts
Metaform Road Sidewalk, Curb & Gutter Forms
Page Dragline Buckets
Red Edge Shovels
Red Star Wheelbarrows, Concrete Carts
Rex Mixers, Pumps, Pavers
Russell Road Plows
Thew-Lorain Shovels
Timken Drill Bits & Rods
Wiard Road Plows
"Williams" Buckets

Member: Associated Equipment Distributors

F. H. BURLEW COMPANY

221-25 W. Huron St., Chicago, Ill.
Telephone SUPerior 5804

AMERICAN HOIST Crawler Cranes, Shovels, Draglines, Bulldozers, Snow Plows
BATES Wire Ties, etc.
BEEBE BROS. Hoists
CHAIN BELT Mixers, Pavers, Pumps, Saw Rigs, Conveyors, Elevators, Pumpcrete, Moto Mixers
ERIE Steel Bins, Batchers, Aggremeter Plants
INSLEY Conc. Towers, Chuting, Cranes, Shovels, Choker Hooks, Carts
M & M Form Clamps
MEYER-HECHT Adjustable Shores
NORDBERG Track Shifters and Tunnel Shovels
SASGEN Derricks
SCHRAMM Air Compressors, Tools
WELLMAN ENGR. CO. "Williams" Buckets, Trailers
IOWA Crushers and Eq.
WINSLOW Whlb. Scales
WYOMING Red Edge Picks, Scoops and Shovels
McKiernan-Terry Corp. (Divisions)
McKIERNAN-TERRY—Pile Hammers, Extractors
LAMBERT-NATIONAL—Hoists, Cableways
STEELE & CONDICT—Special Machinery

Wheelbarrows, Hose, Cable Rope, Tarpaulins, etc., carried in stock

Member: Associated Equipment Distributors

O. T. CHRISTERSON CO.

3900 So. Wabash Ave. Chicago, Ill.

Representing

BLAW-KNOX—Road Forms, Bins, Batchers, Finishing Machines, Buckets, Truck Mixers
C. H. & E.—Road Pumps, Saw Rigs, 2-Ton Rollers
CHICAGO PNEUMATIC TOOL CO.—Compressors, Air Tools, Hose
CLEVELAND—Subgraders, Straight Edges, Finishing Tools
GORMAN-RUPP—Self Priming Centrifugal Pumps, Road Pumps
INSLEY MFG. CO.—Cranes, Shovels, Wagons, Conc. Carts, Derricks
KOEHRING—Mixers, Pavers, Cranes, Shovels, Dumpsters, Mud Jacks, Trail Dumps, Wheelers
KWIK-MIX—Concrete and Bituminous Mixers
PARSONS—Trench Machines, Backfillers, Turbo Mixers
R-B—Power Subgraders, Trailgraders

Concrete Carts, Wheelbarrows, Supplies

PEORIA TRACTOR & EQUIPMENT CO.

400 Franklin Street Peoria, Illinois

Representing

Athey Truss Wheel Co.
Caterpillar Tractor Co.
Killefer Mfg. Corp.
LaPlant-Choate Mfg. Co.
R. G. LeTourneau, Inc.
Willamette Hyster Co.
Universal Crusher Company

Telephone 6177

INDIANA EQUIP. CO., INC.

327-329 West Market St., Indianapolis, Ind.

Representing

ATHEY TRUSS—Wagons, Bulldozers
BUFFALO-SPRINGFIELD—Rollers
"CATERPILLAR"—Road Machinery
"CATERPILLAR"—Tractors
GARDNER-DENVER—Compressors, Tools
LaPLANT-CHOATE—Wagons, Scrapers, Bulldozers
LE TOURNEAU—Scrapers, Buggies, Bulldozers
OWEN—Clam Shell Buckets
PAGE—Dragline Buckets
SAUERMAN—Cableways, Power Scrapers
UNIVERSAL—Crushers, Pulverizers
THEW—Shovels, Draglines
TYLER-NIAGARA—Vibrating Screens

Member: Associated Equipment Distributors

GIERKE-ROBINSON CO.

4th & Ripley Sts. Davenport, Iowa

Representing

BLAW-KNOX—Steel Road, Curb and Gutter Forms, Bins, Batchers, Clamshell Buckets, Track Turntables, Ord Concrete Road Finishers
CHAIN BELT—Mixers, Pavers, Pumps, Saw Rigs, Conveyors, Elevators
CLYDE—Gasoline and Steam Hoists, Derricks
HOUGH-UNIVERSAL—Sweepers
MASTER—Vibrators, Generators, Arc Welders
SULLIVAN—Air Compressors, Tools
TRACKSON—Crawlers, Shovels and Bulldozers
THEW-LORAIN—Cranes, Shovels, Draglines
TIMKEN—Detachable Rock Bits, Steels
UNIVERSAL—Truck Cranes
UNIVERSAL—Form Clamps

Member: Associated Equipment Distributors

THOMAS L. BARRET

Contractors Equipment and Supplies

712 West Main St., Louisville, Kentucky

C. H. & E. Road Pumps, Hoists, etc.
BARRET Asphalt Expansion Joint
RUSSELL Scrapers, Drags, Plows
MASTER Concrete Vibrators
RANSOME Concrete Equipment
PIONEER Crack and Joint Filler
BAY CITY Shovels and Cranes
HAISS Loaders and Conveyors

Reinforcing Steel, etc.

HENRY A. PETTER SUPPLY COMPANY

Paducah Kentucky

Alemite Equipment
American Wire Rope, Mesh
Bates Bar Ties
Beebe Hand Hoist
Black & Decker Tools
Chain Belt (Rex) Mixers
Chattanooga Barrows
Crusca Drill Steel
D-A Lubricants
DuPont Explosives
Dobbie Derricks
Elastite Expansion Joint
Euclid Scrapers
Fairbanks Scales
Farquhar Engines, Boilers
Fulton Road Burlap
Gardner-Denver Tools
General Electric Motors
Goodyear Hose
Hansen Excavators
Hauck Heaters and Thawers
LeRoi Gas Engines
Littleford Equipment
Novo Pumps and Hoists
Oxweld Apparatus
Page Buckets
Portable Conveyors
Republic Reinforcing Steel
Rogers Bros. Trailers
Sasgen Derricks
Sauerman Scrapers
Shunk Grader Blades
Toledo Torches
Universal Concr. Accessories
Vulcan Pile Equipment
Wehr Graders
Western Road Machinery
Worthington Pumps
Wyoming Shovels

FLETCHER EQUIP. CO., INC.

309 Magazine Street New Orleans, La.

American Mfg. Co.
Bethlehem Steel Co.
Bates Valve Bag Corp.
Clyde Iron Works, Inc.
Diamond Iron Works
The Gorman-Rupp Co.
Insley Mfg. Co.
The Jaeger Machine Co.
Jones Superior Machine Co.
C. S. Johnson Co.
Koehring Co.
Kwik-Mix Mixer Co.
Littleford Bros.
M & M Wire Clamp Co.
Mall Tool Co.
Owen Bucket Co.
Parsons Co.
Page Engineering Co.
Portable Machinery Co.
Jos. G. Pollard Co.
Sauger Derrick Co.
Sauerman Bros., Inc.
Sterling Wheelbarrow Co.
Skilsaw, Inc.
Toledo Pressed Steel Co.
Templeton, Kenly & Co., Inc.
Universal Form Clamp Co.
Wood Shovel & Tool Co.

Member: Associated Equipment Distributors

ALBAN TRACTOR CO., INC.

725-27 East 25th St. Baltimore, Md.

Representing

CATERPILLAR TRACTORS AND ROAD MACHINERY

ATHEY TRUSS WHEEL CO.
BLAW-KNOX CO.
BUCKEYE TRACTION DITCHER CO.
GARDNER-DENVER CO.
GENERAL EXCAVATOR CO.
HERCULES ROLLER CO.
"INVADER" SHOVELS
KILLEFER MFG. CORP.
LaPLANT-CHOATE MFG. CO.
LINK-BELT Speed-o-matic Shovels, Cranes, Draglines
PIONEER ENGR. WKS., INC.
R. G. LETOURNEAU, INC.
ROGERS BROS. CO.
WILLAMETTE HYSTER CO.
WM. BROS BOILER MFG. CO.

CATERPILLAR DIESEL AND GAS POWER UNITS

Member: Associated Equipment Distributors

D. C. ELPHINSTONE, INC.

115 S. Calvert St. Baltimore, Md.
976 Nat'l Press Bldg., Washington, D. C.

Representing

E. D. Etnyre & Co.
Electric Tamper & Equip Co.
Emerson Pump & Valve Co.
Erie Steel Constr. Co.
Euclid Road Machinery Co.
Geo. Haiss Mfg. Co.
Goodall Rubber Co.
Gorman-Rupp Company
Griffin Wellpoint Corp.
Hauck Mfg. Co.
H. K. Porter Co.
Hough-Universal Sweepers
Huber Mfg. Co.
Insley Mfg. Co.
Koehring Co.
Kwik-Mix Co.
LaBour Co., Inc.
Lambert-National Hoists
Linn Mfg. Corp.
McKiernan-Terry Corp.
Minwax Co.
Owen Bucket Co.
Parsons Co.
Reed-Prentice Corp.
Sauerman Bros. Inc.
Syntron Co.
Truscon Steel Co.
Worthington Pump & Machy. Corp.

Member: Associated Equipment Distributors

JOHN C. LOUIS COMPANY

511 W. Pratt St.
Baltimore, Md.

Representing

ADAMS—Leaning-Wheel Graders
AMERICAN CABLE—Tru-Lay Wire Rope
BUTLER—Bins
CENTAUR—Road Mowers
GENERAL—Wheelbarrows
GOOD ROADS—Crushers
JAEGER—Concrete Mixers, Pumps, Truck Mixers, etc.
JONES—Saw Rigs
LAKEWOOD—Finishers, Forms, Towers
LITTLEFORD—Asphalt Heater, Distributors
MALL—Conc. Vibrators
TIMKEN—Detachable Rock Bits
WHEELING—Corrugated Culvert Pipe

Member: Associated Equipment Distributors

LANGE TRACTOR & EQ. CO.

210-212 E. Superior St., Duluth, Minn.

Cleveland Rock Drills
Adams Road Machinery and Power Shovels
Atlas Scrapers and Bulldozers
Leach Concrete Mixers
Lenhart Wagons
Gehl Culverts
Hansen Trailers
Wausau Snow Plows
Oshkosh 4-Whl. Drive Trucks
MacWhyte Wire Rope
Speeder Power Shovels

Member: Associated Equipment Distributors

C. F. RABBEITT, INC.

1523 N. Broadway
St. Louis, Mo.

Representing

Cleveland Formgrader Co.
Cleaver-Brooks Co.
Draxo-Doyle Co.
Fairbanks, Morse & Co.
Good Roads Machinery Corp.
Heltzel Steel Form & Iron Co.
Frank G. Hough Co.
Huber Mfg. Co.
Insley Mfg. Co.
Koehring Co.
Kwik-Mix Concrete Mixer Co.
Lidgerwood Mfg. Co.
Master Vibrator Co.
Northern Conveyor Co.
Parsons Co.
Rosco Mfg. Co.
Sterling Machinery Corp.
Sterling Wheelbarrow Co.
Wellman Engineering Co.

Member: Associated Equipment Distributors

LLOYD G. ROSS

3090 Main St. Buffalo, N. Y.

Representing

Allis-Chalmers Mfg. Co.
Burch Spreaders
Coleman Trucks
General Excavator Co.
Hercules Roller Co.
Quick-Way Truck Shovels
Ross Snow Plows

Sale and Rent of All Kinds of Construction Equipment

THE HENRY H. MEYER CO.

110 S. Howard St., Baltimore, Md.
1133 13th St., N.W., Washington, D.C.

Representing

Barber-Greene Co.
Bay City—Shovels
Blaw-Knox Co.
Boston & Lockport Bl. Co.
Phillip Carey Co.
Columbus Conveyor Co.
Connery & Co., Inc.
Dobbie Fdry. & Mach. Co.
Domestic Eng. & Pump Co.
Duff-Norton Mfg. Co.
Harrington Co.
Ingersoll-Rand Co.
A. Leschen & Sons Rope Co.
Lidgerwood Mfg. Co.
Lima Locomotive Works
Master Vibrator Co.
Novo Engine Co.
Pierce Equip. Co.
Pulsometer Steam Pump Co.
Richmond Screw Anchor Co.
Sterling Wheelbarrow Co.
Templeton, Kenly & Co.
Union Iron Works
Universal Road Machy. Co.

Member: Associated Equipment Distributors

THORMAN W. ROSHOLT CO.

3138 Snelling Ave. Minneapolis, Minn.

Representing

BARCO Hammers
BEACH Saws
BUCYRUS-ERIE Scrapers and Bulldozers
BUFFALO-SPRINGFIELD Rollers
CHICAGO Pneumatic Compressors and Tools
CLEAVER-BROOKS Boilers
GORMAN-RUPP CO. Pumps
INSLEY Shovels & Cranes
IOWA "Cedar Rapids" Crusher Plants and Equip.
JOHNSON Batchers and Demountable Bins
KOEHRING Pavers, Mixers, Cranes, Dumptor, Mud-Jacks, Shovels
KWIK-MIX Mixers
LIDGERWOOD Hoists
MASTER Vibrators
McCORMICK-DEERING Industrial Tractors
METAL FORMS CORP.
OWEN Buckets
RAMSEY Hoists and Winches
RIDDELL Power Grader
ROSCO Trailers and Bituminous Distributors
SARGENT Snow Plows
TRACKSON Loaders and Cranes
UNION IRON WORKS
VULCAN Steam and Gas Locomotives
WALTER Trucks

Member: Associated Equipment Distributors

THE GEO. F. SMITH CO.

Franklin & Channing Aves., St. Louis, Mo.

Complete Plants Rented

American Steel & Wire—Rope
Archer—Tower Equipment
Clyde—Hoists and Derricks
Hauck—Heaters
Ingersoll-Rand—Compressors, Air Tools
Kelley—Power Floats
LeRoi—Engines
Link-Belt—Speed-o-matic Shovels, Cranes, Draglines
Mall—Vibrators, Grinders, Saws, Drills
Novo—Pumps
Owen—Clamshell Buckets
Ramsey—Winches
Red Star—Wheelbarrows and Shores
Rodgers—Hydraulic Presses
Sasgen—Derricks & Winches
Skelton—Shovels
Smith—Mixers, Pavers
Speeder—Shovels, Cranes
Symons—Column Clamps
Templeton, Kenly & Co.—Trench Braces, Jacks
Universal—Form Clamps
Vail—Tie Wires and Tools
Vulcan—Hammers
Waukesha—Engines
Winslow—Weighing Scales

Member: Associated Equipment Distributors

EUGENE F. VAN NAME

116 John Street Horseheads, N. Y.

Representing

AEROIL—Burners
ALLIS-CHALMERS—Tractors, Graders
ARMCO—Culverts
A-W—Traffic Tread
BAILY—Vibrators
BAKER—Road Drags, Snow Plows, Bulldozers
C.M.C.—Wonder & Marsh-Capron Mixers
DIAMOND—Crushers, Conveyors, Screening & Washing Equip.
HOTCHKISS—Sidewalk Forms
HUBER—Rollers
JACKSON—Wheelbarrows
LANSING—Wheelbarrows
MILES—Concrete Block Machines
ROWE—Can't Drift Snow Fence
SWEETS—Steel Posts
THEW-LORAIN—Shovels, Cranes
UNIVERSAL-LORAIN—Shovels, Trailers
WILLIAMSPORT—Wire Rope
WISCONSIN SPECIAL—Snow Plows
WORTHINGTON—Compressors

CLARK-WILCOX COMPANY

790-798 Albany St. Boston, Mass.

Representing

ALLIS-CHALMERS—Tractors
ATLAS—Powder, Blasting Equipment
BAKER—Bulldozers
BEEBE BROS.—Hoists
BLYSTONE—Mortar Mixers
BURCH—Ross Plows, Road Machinery
CARTER—"Humdinger" Pumps
COMPLETE—Wellpoints
CLEVELAND—Formgraders
C. R. JAHN CO.—Trailers
HAISS—Elevators, Conveyors and Loaders
HAUCK—Oil Burners and Heaters
HAZARD—Wire Rope, Cable
HELTZEL—Bins and Forms
HOMESTEAD—Hypressure Jenny Cleaner
INGERSOLL-RAND—Air Compressors
NORTHWEST—Cranes, Shovels, Draglines
ORR-SEMBOWER—Hoists, Boilers, Mixers
PIERCE—Refuse Burners
PIONEER—Crushers, Gravel Plants
RANSOME—Concrete Mixers, Chuting Equip.
MASTER—Vibrators

Member: Associated Equipment Distributors

WM. H. ZIEGLER CO., INC.

Minneapolis, St. Paul, Duluth, Crookston, Minn.

ATHEY—Crawlers, Dump Wagons, Trailers
BARBER-GREENE—Conveyors, Loaders, Ditchers
BUCYRUS-ERIE—Power Shovels, Cranes, Draglines
BUTLER—Bins, Batchers
"CATERPILLAR"—Tractors, Engines, Road Machinery
DAVENPORT - BESLER—Locomotives
FOUR WHEEL DRIVE AUTO CO.—Trucks
FRINK—Snow Plows
GARDNER-DENVER—Air Compressors, Drills
HOMESTEAD—Hypressure Jenny Spray Cleaners
KILLEFER—Road Rippers, Scrapers
LaPLANT-CHOATE—Bulldozers, Snow Plows, Dump Wagons
LESCHEN—Wire Rope
LeTOURNEAU—Dirt Moving Equipment
LITTLEFORD—Oil Distributors, Tar Kettles, Heaters
MADSEN—Asphalt Plants
PIONEER—Crushers, Gravel Plants
REX—Mixers, Pavers, Mo-to-Mixers, Pumps
"WILLIAMS"—Buckets, Heavy-Duty Trailers

Member: Associated Equipment Distributors

HAVE YOU CHANGED YOUR LOCAL ADDRESS?

Sometimes in the rush of moving to a new location you fail to send us your new address. And as we are anxious to get your copy of the magazine to you on time do not put off writing us. Thank you.

CONTRACTORS AND ENGINEERS MONTHLY
470 Fourth Avenue, New York

COMPLETE MACHINERY & EQUIPMENT CO., Inc.

"Specialists in Pumps"

Webster Ave. and Hancock St.
Long Island City New York

Representing

COMPLETE—Wellpoint Systems
INGERSOLL-RAND CO.—Air Compressors
KADCO CORP.—Dust Control Equipment
KOEHRING CO.—Concrete Mixers
McKIERNAN-TERRY CORP.—Pile Hammers
MALL TOOL CO.—Concrete Vibrators
MARLOW—Self-priming Centrifugal & Plunger Pumps

RENTAL SERVICE

Member: Associated Equipment Distributors

THE EQUIPMENT CO.

30 Prentiss St. Boston, Mass.

Representing

Hanson Excavators and Trailers

Ingersoll-Rand Compressors and Tools

Link-Belt Speed-o-matic Shovels, Cranes, Draglines

"Williams" Buckets and Trailers

COMPLETE RENTAL SERVICE

Member: Associated Equipment Distributors

BUBLITZ MACHINERY CO.

2305 Pennway, Kansas City, Mo.

Representing

Ames Baldwin Wyoming Co.
Austin-Western Rd. Machy. Co.
Bethlehem Steel Co. (Williamsport Div.)
Butler Bin Co.
Cleveland Tractor Co.
Electric Tamper & Equipment Co.
Jaeger Machine Co.
Lakewood Engineering Co.
MacMillan Petroleum Corp.
McKiernan-Terry Corp.
Red Star Products Co.
Sasgen Derrick Co.
Schramm, Inc.
Thew Shovel Co.
Whitcomb Locomotive Co.
"Williams"—Buckets and Trailers

Member: Associated Equipment Distributors

HEYNIGER BROTHERS

Sale ***Rent***

Contractors' Equipment

6th Ave. & F St., Belmar, N. J.

Jaeger Mixers
Self-Priming Pumps
Diaphragm Pumps
Richmond Form Ties
Rubber Hose and Boots
Manila and Wire Rope
Expansion Joint
Screw Jacks
Air Compressors
Grass Mowers
Aeroil Torches & Kettles
Reinforcing Rods
Cement Waterproofing
Galvanized Rods and Bolts
Iron and Wood Blocks
Heavy Hardware

GEORGE MALVESE & CO.

New Hyde Park, N. Y.

Long Island Distributors:

ADAMS Graders
BRODERICK & BASCOM Wire Rope
CLETRAC Crawler Tractors
EUCLID Scrapers
LITTLEFORD Tar Kettles, Heaters, Distributors, etc.
LOCKE Power Mowers
OLIVER Implements
SARGENT Snow Plows
"SILVER KING" Tractors
WORTHINGTON Power Mowers
Also Pumps, Mixers

HEDGE & MATTHEIS CO.

288 DORCHESTER AVE. BOSTON, MASS.

Boston, Springfield, Worcester, Mass.; Portland, Bangor, Me.; Hartford, New Haven, Conn.; Concord, N. H.; Bellows Falls, Vt.; Providence, R. I.

J. D. Adams Co.
Aeroil Burner Co.
Amer. Tubular Elevator Co.
Brook Eq. & Mfg. Co.
Byers Machine Co.
Chicago Automatic Conveyor Co.
Electric Tamper & Eq. Co.
Fanning-Schuett Engrg. Co.
Four-Wheel Drive Sales Co.
Frink, Carl H.
Huber Mfg. Co.
Ingersoll-Rand Co.
Jaeger Machine Co.
Jones Superior Machine Co.
Lakewood Engrg. Co.
A. Leschen & Sons Rope Co.
Lima Locomotive Wks., Inc., Shovel & Crane Division
Lima Manufacturing Corp.
McKiernan-Terry Corp., and Lambert-Nat'l Hoist Div.
Owen Bucket Co.
Page Engineering Co.
Red Star Products Co.
Rogers Bros. Corp.
Sasgen Derrick Co.
Sauerman Bros. Inc.
Syntron Co.
Toledo Pressed Steel Co.
Universal Form Clamp Co.
Wood Shovel & Tool Co.

Member: Associated Equipment Distributors

O. B. AVERY COMPANY

1325 Macklind Avenue St. Louis, Mo.

Exclusive Distributors of

AUSTIN Trenchers
AUSTIN-WESTERN Graders, Rollers, Sweepers, Scrapers
BAILY Vibrators
BLAW-KNOX Bins, Buckets, Finishers, Forms
BRODERICK & BASCOM Wire Rope
CHAIN BELT Mixers, Pavers, Pumps
DEMPSTER Dumpsters
KEWANEE Conveyors
KOB Spreaders
LaCROSSE Trailers
LAMBERT-NATIONAL Hoists
McKIERNAN-TERRY Pile Hammers
NORTHWEST Shovels, Cranes & Draglines
PIERCE Rollers
R-B Subgraders **CEDAR RAPIDS Crushers**
SKILSAW Electric Tools **BARCO Hammers**
STANDARD Bituminous Distributors
SULLIVAN Compressors & Air Tools
VULCAN Locomotives

Member: Associated Equipment Distributors

DALE & RANKIN, INC.

113 Frelinghuysen Ave., Newark, N. J.

Representing

AEROIL Heaters and Tools
ALEMITE Guns and Fittings
CHAMPION Sewer Cleaning Machines
HANSON Cranes & Excavating Equip.
HANSON Heavy-Duty Trailers
HELTZEL Road Forms and Bins
INGERSOLL-RAND Compressors and Tools
JACKSON Wheelbarrows
LINK-BELT Speed-o-matic Shovels, Cranes, Draglines
REX Mixers and Pavers
REX Pumps
UNIVERSAL Concrete Accessories
VIBER Elec. & Pneu. Concrete Vibrators
WALSH Snow Plows
WINSLOW Scales

Member: Associated Equipment Distributors

R. E. BROOKS COMPANY

"Serving the Contractor for over 28 years"

50 Church Street New York, N.Y.

Beach Mfg. Co.—Saw Rigs
Blaw-Knox Co.—Road and Sidewalk Forms, Bins, Batchers, Finishing Machines, Buckets
Cleaver-Brooks Co.—Tank Car Heaters, Boosters
Gorman-Rupp Co.—Pumps
Insley Mfg. Co.—Excavators, Concrete Chuting Plants, Buckets, Cars
Koehring Co.—Pavers, Mixers, Shovels, Cranes, Mud Jacks, Wheelers, Dumptors, Longitudinal Finishers
Kwik-Mix Mfg. Co.—Concr. Mixers
Master Vibrator Co.—Concr. Vibrators
Parsons Co.—Trench Machines
Pioneer Engrg. Wks., Inc.
Rosco Mfg. Co.—Oil Distributors

Member: Associated Equipment Distributors

ABRAMS-ANDERSON CO.

Construction Equipment

10425 Northlawn Ave., Detroit, Mich.

Representing

Aeroil Burner Co.
Archer Iron Works
Brookville Locomotive Co.
Butler Bin Company
Bucyrus-Erie Co.
C. H. & E. Mfg. Co.
Hazard Wire Rope Company
Independent Pneumatic Tool Co.
LeRoi-Rix Compressors
Sasgen Derrick Company
T. L. Smith Company
Smith Engineering Works
Sterling Wheelbarrow Co.
Toledo Pressed Steel Co.

Member: Associated Equipment Distributors

CORBY SUPPLY COMPANY

3942-46 W. Pine Blvd., St. Louis, Mo.

Representing

AMERICAN—Flexible Metal Hose
BUHL CO.—Portable Air Compressors
CHAMPION RIVET CO.—Rivets and Welding Rod
DETROIT HOIST & MACH. CO.—Air and Electric Hoists
DeVILBISS CO.—Paint Spray Equipment
HARDSOCG WONDER DRILL CO.—Rock Drills and Paving Breakers
WM. H. KELLER, INC.—Super Pneumatic Tools
MUNSELL—Air-Operated Concrete Vibrators
PANGBORN CORP.—Sandblast Equipment
PENNSYLVANIA—Air Compressors and Pumps
DAVID ROUND & SON—Chain Hoists
STAYNEW—Air and Pipeline Filters
N. A. STRAND & CO.—Flexible Shaft Equipment
VAN DORN—Electric Drills, Grinders and Buffers
VICTOR—Welding and Cutting Appratus
WESTINGHOUSE—Arc Welding Equipment
GUSTAV WIEDEKE CO.—Tube Expanders

JOHNSON & DEALAMAN, INC.

255 South Street Newark, N. J.

Representing

ALLIS-CHALMERS Tractors, Graders & Power Units
AMERICAN Snow Plows, Hoists, Derricks
AMERICAN CABLE Tru-lay & Crescent Wire Rope
BAKER Bulldozers, Gradebuilders, Scrapers & C.H.E. Saw Tables
BROOKS Load Laggers
CONTINENTAL Scrapers
GAR WOOD Bulldozers, Scrapers, Road Equipment
HOTCHKISS Road, Sidewalk & Concrete Forms
HOUGH Hydr. Loaders for Tractors
JOHNSON Steel Bins, Batchers, Scales
MARLOW Centrifugal, Diaphragm and Plunger Pumps
RANSOME Pavers, Mixers, Chuting Equipment
RED STAR Wheelbarrows, Batch Boxes, Column Clamps and Adjustable Shores
SCHRAMM Air Compressors
Vibrators, Trailers, Shovels, Cranes, Rollers, etc.

Member: Associated Equipment Distributors

A. P. DIENST CO., Inc.

Contractors' Supplies

140th St. & 3rd Ave., New York, N. Y.

Distributors for

DUFF Sewer Trench Braces
GREDAG Grease
KEYSTONE Grease
TOLEDO Bull Frog Wheelbarrows
WYOMING Red Edge Shovels
YALE Hoists

Telephone MOtt Haven 9-5430

CONTRACTORS MACHY. CO.

530 Monroe Ave., N.W. Grand Rapids, Mich.

Aeroil Burner Co., Inc.
American Steel & Wire Co.
Ames Shovels
Atlas Conveyors
Baron Gas Hammers
Bates Wire Ties
Black & Decker Tools
Blaw-Knox Company
Burch Corporation
Clyde Iron Works, Inc.
Connery & Company, Inc.
Dietz Lanterns
Lansing Company
LeRoi Company
Master Vibrators
Moritz-Bennett Company
Northwest Engineering Co.
Page Engineering Co.
Pioneer Engineering Works, Inc.
Rex Mixers and Pumps
Ross Snow Plows
Rowe Manufacturing Co.
Sasgen Derrick Company
Sauerman Brothers
Sullivan Machinery Co.
Syntron Company
Toledo Pressed Steel Co.
Trackson Co.

Member: Associated Equipment Distributors

JOSEPH KESL RENTAL EQUIPMENT CO.

1510 North 13th St., St. Louis, Mo.

Air Compressors
Blade Graders
Bulldozers, Backfillers
Concrete Mixers
Crawler Wagons, Tractors
Elevating Graders
Hoists
Hydraulic Scrapers
Motor Graders
Pumps
Rock Crushers
Rollers
Rotary Scrapers
Sand, Gravel Eq.
Shovels and Draglines
Wheel Tractors

Member: Associated Equipment Distributors

CONTRACTORS SALES CO., INC.

P. O. Box 949, Albany, N. Y.
P. O. Box 334 Utica, N. Y.

Representing

Allis-Chalmers Mfg. Co.—Tractors, Road Machy.
Baker Mfg. Co., Inc.
Barber-Greene Co.
General Excavator Co.
Headley Asphalt Co.
Hercules Roller Co.
Hough Universal Sweepers
Ingersoll-Rand Co.
Jaeger Machine Co.
The Osgood Co.

HARMON-HODGE-HAMMOND, INC.

Construction Equipment

1162 Grinnell Place The Bronx, N.Y.C.

Phone: DAyton 9-5300

Exclusive Distributors

ALLIS-CHALMERS Tractors and Graders
BAKER Bulldozers, Gradebuilders, Snow Plows
BARNES Diaphragm and Self-Priming Pumps
CONTINENTAL Hydraulic Scrapers
FOOTE Paving Mixers, Blacktop Machines
GARDNER-DENVER Compressors and Rock Drills
JAHN Heavy-Duty Trailers
NORTHWEST Shovels, Cranes, Draglines
R-B Finegraders
GAR WOOD Hydraulic Scrapers

J. C. HOUSTON

30 Church Street New York, N.Y.

Representing

BROWNING CRANE & SHOVEL CO.
HOISTING MACHINERY CO.

Warehouse

ELIZABETH, N.J.—L.V.R.R.

MAHONEY-CLARKE, INC.

Complete Line of Contractors' Equipment and Supplies.

217 Pearl Street New York, N. Y.

Representing

Baily Gas, Elec. Conc. Vibrators
Boston Woven Hose & Rubber Co. all types of Hose and Belting
Broderick & Bascom Wire Rope
Godwin Conc. Buy. Joint Assemblies
Hotchkiss Road & Sidewalk Forms
Ingersoll-Rand Compressors, Drills, Pneu. Tools, etc.
Lansing Concrete, Mortar Mixers
Richmond Tyners, Anchors
Sterling Pumps of all descriptions
Temple Road Material Spreaders
Tuthill Hwy. Guard Rail, Hwy. Divider
Vulcan Pile Hammers, Extractors, Parts
Wiley Concrete Buckets

Rental Service

H. O. PENN MACHY. CO., INC.

140th St. & East River The Bronx, N. Y. C.

Branches

Mineola, L. I. Poughkeepsie, N. Y.

Representing

ATHEY TRUSS WHEEL CO.
CATERPILLAR Tractors and Accessories
DEERE Indus. Tractors
FRINK Snow Plows
HELTZEL Steel Bins, Forms
KIESLER Buckets
LaPLANT-CHOATE MFG. CO.
LeROI Compressors, Engines
MARION Shovels, ¾-2 yds.
MARLOW Pumps
R. G. LeTOURNEAU, INC.
SMITH Mixers, Pavers
SPEEDER Shovels, ½-⅝ yd.

Warehouse Stock—Service Station

Member: Associated Equipment Distributors

UNITED HOISTING CO., INC.

165 Locust Avenue

NEW YORK, N.Y.

Representing

Construction Machy. Co.—Concrete, Plaster & Mortar Mixers, Saw Rigs, Pumps, Hoists and Pneumatic Tired Concrete Carts
Independent Pneumatic Tool Co.—"Thor" Pneumatic Tools, Hand Saws, and Sump Pumps
Portable Machy. Co.—Portable and Stationary Belt Conveyors
Sterling Mfg. Co.—Wheelbarrows & Concrete Carts
Sullivan Machy. Co.—Compressors, Pneumatic Tools and Accessories
White Mfg. Co.—Concrete Vibrators, Grinders and Heaters

Member: Associated Equipment Distributors

THE SYRACUSE SUPPLY CO.

314 W. Lafayette St. Syracuse, N. Y.

CONSTRUCTION EQUIPMENT DIVISION

Syracuse—Rochester—Buffalo

Athey Truss Wheel Co.
Atlas Powder Co.
Bethlehem Wire Rope
Blaw-Knox Co.
Caterpillar Tractor Co.
Clyde Iron Wks., Inc.
D-A Lubricant Co., Inc.
Goodyear Tire & Rubber Co.
Gorman-Rupp Co.
Hauck Heaters
Ingersoll-Rand Co.
Iowa Mfg. Co.
Johns-Manville (Bridge Planks)
Killefer Mfg. Co.
LaPlant-Choate Mfg. Co.
Master Vibrator Co.
R. G. LeTourneau, Inc.
Speeder Machinery Corp.
Timken Roller Bearing Service & Sales Co.—Timken Bits & Rods
Trackson Co.
Universal Form Clamp Co.
Willamette Hyster Co.

Member: Associated Equipment Distributors

NORTH CAROLINA EQ. CO.

Raleigh Statesville

Aeroil Burner Company
American Cable Company
Barco Mfg. Co.
Buckeye Traction Ditcher Company
Bucyrus-Erie Tractor Eq.
Cleaver-Brooks Company
Electric Tamper & Eq. Co.
Elgin Corporation
Euclid Road Machy. Co.
Fairbanks, Morse & Co.
Fairfield Engrg. Co.
Four Wh. Dr. Auto Co.
Frank G. Hough Co.
Gallion Allsteel Body Co.
Galion Iron Wks. & Mfg. Co.
Good Roads Mach. Corp.
Heltzel Steel Form & Iron Company
Highway Trailer Co.
Ingersoll-Rand Company
Internat'l Harvester Co.
Iowa Manufacturing Co.
Jaeger Machine Company
Jeffrey Manufacturing Co.
Jos. F. Kiesler Company
Kensington Steel Company
Municipal Supply Co.
Northwest Engineering Co.
Page Engineering Company
Rogers Bros. Corp.
The C. S. Johnson Co.
Wellman Engineering Co.

Member: Associated Equipment Distributors

CAROLINA TRACTOR & EQUIPMENT COMPANY

S. Main Ext. Salisbury, N. Car.

Branch Office and Warehouse: Raleigh, N. C.

ATHEY Track-wheel Wagons
BARBER-GREENE Conveyors, Car Unloaders
BLAW-KNOX Steel Forms, Bins, Buckets, Trukmixers
CATERPILLAR Tractors, Graders, Power Units
DIAMOND Roll, Jaw Crushers
ETNYRE Bituminous Distributors, Flushers.
GARDNER-DENVER Air Compressors, Drills
HUBER Rollers
JAHN Machinery Trailers
LaPLANTE-CHOATE Wagons, Bulldozers
LeTOURNEAU Carry-all Scrapers
SLUSSER-McLEAN Wheelers, Rippers, Fresnos
THEW Shovels, Cranes
WONDER Mixers, Pumps, Hoists

Member: Associated Equipment Distributors

THE CLETRAC OHIO SALES CO.

E. 193rd Street and Euclid Ave.

Cleveland Ohio

Representing

THE CLEVELAND TRACTOR CO.—Crawler Tractors
THE DAVEY COMPRESSOR CO.—Air-Cooled Compressors
THE EUCLID ROAD MACHY. CO.—Crawler Wagons, Scrapers, Bulldozers
THE ISAACSON IRON WORKS—Power Scrapers, Trailbuilders
MacMILLAN Ring Free Oil
MAIN STEEL PRODUCTS CO.—Snow Plows
MEAD MORRISON—Winches
THE TRUCK ENGINEERING CORP.

W. T. WALSH EQUIPMENT CO.

3088 West 106th St., Cleveland, Ohio Tel. Clearwater 4400

Allis-Chalmers—Tractors
Anthony—Dump Bodies
Baker Mfg. Co.—Bulldozers
Broderick & Bascom—Wire Rope
Cleveland Rock Drill Co.—Air Tools
Construction Machy. Co.—Mixers
Continental—Scrapers
Foote Company—Pavers
General Excavator Co.—Shovels
Hough—Loaders
Iowa Mfg. Co.—Crushers
The C. S. Johnson Co.
McKiernan-Terry Corp.—Pile Hammers
Michigan—Power Shovels
Novo Engine Co.—Engines, Light Plants, Pumps
R-B Equipment Co.—Finegraders
Reeves Mfg. Co.—Distributors & Oilers
Schramm, Inc.—Air Compressors
The T. L. Smith Co.—Truck Mixers
Timken—Bits
Wellman Engineering Co.—"Williams" Buckets
Wm. Bros Mfg. Co.—Tamping Rollers
Gar Wood—Scrapers

Member: Associated Equipment Distributors

SOUTHERN OHIO EQUIP. CO.

169-171 W. Main St.,
Zanesville, Ohio

On Route 40

Phone 813

Distributors for

Allis-Chalmers Mfg. Co.
Apollo Culvert Works
Bethlehem Wire Rope
Byers Machine Co.
Cleveland Rock Drill Co.
D-A Lubricant Co.
Iowa Mfg. Co.
Schramm, Inc.
Shunk Mfg. Co.
Slusser-McLean Co.
Timken Roller Bearing Co.

CLYDE EQUIPMENT CO.

Contractors' Equipment and Supplies

Portland, Ore. Seattle, Wash.

Allis-Chalmers Mfg. Co.
Atlas Imperial Diesel Eng. Co.
Beebe Bros.
Bucyrus-Erie Co.
Clyde Iron Works, Inc
Geo. Haiss Mfg. Co., Inc.
Klauer Mfg. Company
Kohler Co.
LeRoi Company
A. Leschen & Sons Rope Co.
Lincoln Electric Co.
Sauerman Brothers
T. L. Smith Co.
Smith Engineering Works
Sullivan Machinery Co.

Member: Associated Equipment Distributors

HAVE YOU CHANGED YOUR LOCAL ADDRESS?

Sometimes in the rush of moving to a new location you fail to send us your new address. And as we are anxious to get your copy of the magazine to you on time do not put off writing us. Thank you.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue, New York

GASH-STULL CO.

Chester Pennsylvania

Representing

ANTHONY COMPANY
FORDSON Tractors and Equipment
MICHIGAN Power Shovels
OSGOOD COMPANY
SCHRAMM, INC.
TRACKSON COMPANY

LOCOMOTIVES

HOISTS—SCRAPERS—WIRE ROPE

MANGANESE DIPPER TEETH

EDELEN & BOYER COMPANY

Office and Warehouse Philadelphia
236 North 23rd St. Penna.

Distributors of

Adnun Stone Spreaders
Adnun Black Top Pavers
Aeroil Heaters, Melting Pots
Archer Towers, Buckets
"Cletrac" Tractors
CMC Master Mixers, Saw Rigs
CMC Self-Priming Pumps
Flex-Plane Finishing Machine
Hayward Clamshell Buckets
Heltzel Finishing Mach.
Heltzel Steel Forms, Bins
Jackson Wheelbarrows, etc.
LaCrosse Tu-Way Trailers
Lidgerwood Hoists
Marsh-Capron Mixers
Miles Block Machines
Multi Foote Pavers
New Haven Burlapped-Cotton Blankets
Pulsometer Steam Pumps
Ransome Tr. Mixers, Agitators
R-B Finegrader
Saugen Derricks, etc.
Sullivan Portable Air Comp.
Tru-Lay Steel Cable
Union Pile Hammers
White Vibrators
Wondor Concrete Mixers

GILES & RANSOME

17th St. & Sedgley Ave., Philadelphia

Athey Truss Wheel Co.—Crawler Wagons
Barnes Mfg. Co.—Centrifugal Diaphragm and Force Pumps
Blaw-Knox Co.—Clamshell Buckets, Road Forms, Material and Cement Bins
"Caterpillar"—Tractors and Road Machinery
Davey—Air Compressors
R. G. LeTourneau, Inc.—Carryalls, Buggies
Master—Elec., Gas. Concrete Vibrators
Northwest Engineering Co.—Gasoline Cranes, Shovels and Draglines
Ord—Road Finishing Machine
Ransome Concrete Machinery Co.—Concrete Mixers and Appliances

Member: Associated Equipment Distributors

HOWARD W. READ CORP.

800 N. Delaware Ave., Philadelphia, Pa.

Distributors

Ralph B. Carter Co.
Geo. Haiss Mfg. Co.
Ingersoll-Rand Co.
Insley Mfg. Co.
Koehring Co.
Pomona Pump Co.
Quick-Way Truck Shovel Mfg. Co.
Vulcan Iron Works, Inc.—Pile Hammers

Also Carry in Stock:

Hoisting Engines, Gas and Steam

Truck Cranes

SERVICE SUPPLY CORPORATION

20th and Venango Sts., Philadelphia, Pa.

Representing

Baily Vibrator Co.—Vibrators
Bay City Shovels, Inc.—Shovels, Cranes, etc.
Chicago Pneumatic Tool Co.—Compressors, Air Tools
Cleaver-Brooks Co.—Tank Car Heaters and Boosters
Dravo-Doyle Co.—Tubular Hoisting Towers
Hercules Company—Road Rollers
International Harvester Co.—Indus. Wheeltype and Crawler Tractors
Jaeger Machine Co.—Mixers, Truck Mixers, Pumps, Black Top Pavers, Finishing Machines
C. S. Johnson & Co.—Bins, Batchers, Cement Handl. Eq.
Lambert-National—Hoists
Littleford Bros.—Road Oil Distrs. Heating Kettles, etc.
McKiernan-Terry Corp.—Pile Hammers
Nelson Iron Works—Loaders and Belt Conveyors
The Parsons Company—Trench Machines, Snow Plows
W. A. Riddell Corp.—Power Graders

Member: Associated Equipment Distributors

J. JACOB SHANNON & COMPANY

1744—Sedgley Avenue—1744
PHILADELPHIA

Representing

Allis-Chalmers Mfg. Co.—Tractors, Graders
Baker Mfg. Co.—Bulldozers, Blade & V Type Snow Plows
C. H. & E. Mfg. Co.—Saw Rigs, Rollers, Hoists
Chain Belt Co.—Conc. Truck Mixers, Pavers, Glass Mixers, Pumps, Pumpcrete.
Clyde Iron Wks., Inc.—Gas, Elec., Steam Hoists
Concrete Surfacing Machinery Co.—Berg Surfacers
Ingersoll-Rand Co.—Air Compressors, Pneumatic Tools
Iowa Mfg. Co.—Crushers, Conveyors & Asphalt Plants
Lima Locomotive Wks.—Shovels, Cranes, Draglines
Richmond Screw Anchor Co.—Form ties
John A. Roebling's Sons Co.—Wire rope, Fittings
Saugen Derrick Co.—Derricks and Winches
Shannon—Derricks and Derrick Fittings
Speeder Mach. Co.—Shovels, Cranes
Gar Wood—Scrapers, Bulldozers

Member: Associated Equipment Distributors

WESTERN MATERIAL CO.

Aberdeen, Sioux Falls, Rapid City, S. D.

Allsteel Prod.—Pipelines
Athey—Wagons
Calderson—Snow Plows
Barnes—Pumps
Bates—Wire Ties
Blackhawk—Indus. Jacks
Broderick & Bascom—Rope
Butler—Bins, Hoppers
Philip Carey—Exp. Joint
"Caterpillar"—Equipment
Chain Belt—Pumps, Mixers
Clyde—Hoists
Conc. Surfacing—Surfacers
Coffing—Hoists
D-A—Lubricants
Davey—Compressors
Day—Crushers
Grae—Road Sweepers
H'way Safety—Refruc. Markings
H'way Trailer—Earthboring Eq.
Killefer—Road Equipment
Kob—Spreaders
LaPlant-Choate—Tractor Eq.
LeTourneau—Dirt-Moving Eq.
Littleford—Markers, etc.
LeRoi—Gas Engines
Manhattan—Belting
Rockwood—Pulleys
Rotary—Snow Plows
Saugen—Derricks
Slusser-McLean—Scrapers, Fresnos
Spencer—Shovels
Sterling—Wheelbarrows
Stolle—Road Equipment
Surestop—Traffic Signs
Templeton-Kenly—Jacks
Wright—Guard Rail Eq.
Western Cataphote—Signs
Willard—Plows
Willamette Hyster—Winches
Wood—Shovels

Member: Associated Equipment Distributors

NIXON-HASSELLE COMPANY, INC.

Contractors' Equipment

Chattanooga Tennessee

Representing

BLAW-KNOX Buckets, Forms
INGERSOLL-RAND Compressors, Jackhammers
MUNDY Hoists
AUSTIN-WESTERN Graders, Crushers, Rollers, etc.
BARBER-GREENE Loaders, Conveyors
NORTHWEST Cranes, Shovels
ARCHER Towers, Spouting Equipment
REX Mixers, Pavers, Pumps
CLETRAC Tractors
NEWPORT Culvert Pipe
VULCAN Gas Locomotives
JAHN Machy. Trailers
DOBBIE Derricks
HOUGH—"Universal" Road Scraper
LIDGERWOOD Hoists
SYNTRON Hammers, Vibr.
EAGLE Crushers & Pulv.
FOUR WH. DRIVE Trucks
TIMKEN Detach. Bits

Also Wheelbarrows, Carts, Benders, Cutters, Shovels, etc.

Member: Associated Equipment Distributors

BROOKS EQUIP. & MFG. CO.

Knoxville 408 Davenport Rd. Tennessee

Representing

J. D. Adams Co.
Bucyrus-Erie Co.
Burch Corp.
Cincinnati Rubber Mfg. Co.
Continental Roll & Steel Co.
Crucible Steel Co.
Dravo-Doyle Co.
Galion All-Steel Body Co.
Gardner-Denver Co.
Heltzel Steel Form & Iron Co.
Hug Co.
Independent Pneu. Tool Co.
International Harvester Co.
Jaeger Machine Co.
C. S. Johnson Co.
Lima Mfg. Corp.
Master Vibrator Co.
McKiernan-Terry Corp.
N. P. Nelson Iron Works
Owen Bucket Co.
Pioneer Engrg. Wks., Inc.
Reeves Mfg. Co.
Upson-Walton Co.
Viber Co.

Member: Associated Equipment Distributors

WILSON-WEESNER-WILKINSON CO.

Nashville Tennessee

Representing

Allis-Chalmers Mfg. Co.
Ames Baldwin Wyoming Co
Baker Mfg. Co.
Blaw-Knox Co.
Cleaver-Brooks Co.
Clyde Iron Works, Inc.
Electric Tamper & Eq. Co.
E. D. Etynre Co., Inc.
Gorman-Rupp Co.
Ingersoll-Rand Co.
Insley Mfg. Co.
Koehring Co.
Littleford Bros.
The Parsons Co.
Smith Engineering Works
Gar Wood Industries

NASHVILLE—KNOXVILLE

Warehouse Stocks of Service

Reinforcing Steel and Mesh

Member: Associated Equipment Distributors

BROWNING-FERRIS MACHY. CO.

205 Exposition Ave. Dallas, Texas
Texas at Rice Sts. Houston, Texas

Representing

Buckeye Traction Ditcher Company
Foote Company—Pavers
Galion Iron Works & Mfg. Co.
Heil Co.—Wagon Scrapers
Ingersoll-Rand Company
International—Tractors
Iowa Mfg. Co.—Cedar Rapids Line
Jaeger Machine Company
Jones Superior Mach. Co.
Littleford Brothers
The Owen Bucket Company
Page Engineering Co.
Sterling Wheelbarrow Co.
Thew Shovel Company
Trackson Company

Member: Associated Equipment Distributors

R. B. EVERETT & CO.

3112-18 Harrisburg Blvd. Houston, Texas

BLAW-KNOX Road Plant Equipment, Bins, Clam Shell Buckets
AMERICAN Hoisting Machinery
"P. & H." Gasoline Cranes
McKIERNAN-TERRY Pile Hammers, etc.
CONNERY Asphalt Equip.
CHAIN BELT Concrete Mixers, Saw Rigs, Pavers
NOVO Engines, Hoists, Pumps
"RED STAR" Wheelbarrows
SAUERMAN Cableways
BATES Wire Ties
PULSOMETER & NYE Steam Pumps
PATENT Safety Swinging Scaffolding
TRU-LAY Wire Rope
BUFFALO-SPRINGFIELD Road Builders
SULLIVAN Compressors
PORTABLE Conveyors
ETNYRE Asphalt Distrs.
FLYNN Surfacer
PAGE Dragline Buckets
MALL Vibrators

Member: Associated Equipment Distributors

PHILLIPS MACHINERY CO.

900 East Cary St. Richmond, Va.

Representing

Aeroil Burner Co., Inc.
Austin Machinery Corp.
Broderick & Bascom Rope Co.
Butler Bin Company
Chain Belt Company
Clyde Iron Wks., Inc.
Chicago Pneumatic Tool Co.
General Excavator Co.
Jackson Mfg. Co.
Manitowoc Engineering Works
Master Vibrator Company
Rogers Brothers Corp.
Sauerman Brothers, Inc.
Stephens-Adamson Mfg. Co.
Van Dorn Electric Tool Co.

Member: Associated Equipment Distributors

CONSTRUCTION EQUIPMENT CO.

1118-1124 Ide Ave., Spokane, Wash.

Aeroil Burner Co., Inc.
Archer Iron Works
Bates Wire Ties
Beebe Bros.
Blystone Mfg. Co.
Broderick & Bascom Rope
Buffalo-Springfld. Roller Co.
Butler Bin Co.
Chain Belt Co.
Climax Eng. Co.
Concrete Surf. Machy. Co.
D-A Lubricant Co.
Detroit Graphite Co.
R. E. Dietz Co.
Duff-Norton Mfg. Co.
Fairbanks, Morse & Co.
Fate-Root-Heath Co.
Homestead Valve Mfg. Co.
Kalamazoo Ry. Supply Co.
LeRoi Co.
Linde Air Products Co.
M. & M. Wire Clamp Co.
Mall Tool Co.
Niagara Mfg. Co.
Red Star Products Co.
Saugen Derrick Co.
Sheldon Mfg. Co.
Sterling Machinery Corp.
Sterling Wheelbarrow Co.
Sullivan Machinery Co.
Sunbeam Mfg. Co.
Templeton, Kenly & Co.
Thew Shovel Co.
Wilkamette Hyster Co.
"Williams" Buckets, etc.
Young Iron Works

Member: Associated Equipment Distributors

BOEHCK EQUIPMENT CO.

2404 W. Clybourn St. Milwaukee, Wis.

Representing

American Hoist & Derrick Co.
Byers Machine Co.
Corrugated Steel Sheet Piling Corp.
Electric Tam. & Equip. Co.
Hauck Mfg. Company
Hercules St. Products Co.
Homestead Valve Mfg. Co.
Independent Pneumatic Tool Co.
Jaeger Machine Co.
C. S. Johnson Company
Jones-Superior Machine Co.
LeRoi Co.
A. Leschen & Sons Rope Co.
Lima Locomotive Works
McKiernan-Terry Corp.
Portable Machinery Company
Red Star Products, Inc.
Saugen Derrick Co.
Superior Concrete Accessories, Inc.
Wellman Engineering Co.

Member: Associated Equipment Distributors

DROTT TRACTOR CO., Inc.

3841 W. Wisconsin Ave.

Milwaukee Wisconsin

Representing

ALLIS-CHALMERS Tractors, Graders, Speed Patrols, Hauling and Power Units
OSHKOSH 4-Wh.-Drive Trucks & Earth Movers. 4-Wh. steer, 4-Wh. drive
PIONEER Gravel and Rock Crushing Equipment
WAUSAU Snow Plows
DROTT Bulldozers, Scrapers, Scarifiers, Hydraulic Equipment, etc.
LaCROSSE Trailers
KOB Sand Spreaders
HERCULES Road Rollers
RUSSELL Scrapers, Plows
CONTINENTAL Dirt-Moving Scrapers
HOUGH Loaders, Snoopers
CUMMINS Diesel Engines
JOY Stone Loaders
GAR WOOD Dirt Moving Scrapers

Member: Associated Equipment Distributors

Contractors and Engineers Monthly

THE JUDGES FOR OUR 1939 ROADSIDE DEVELOPMENTS AWARDS

Hugh H. Bennett, Chief, Soil Conservation Service, U. S. Department of Agriculture

Charles M. Upham, Engineer-Director, American Road Builders' Association

Harris & Ewing Photo
Roy W. Crum, Director, Highway Research Board, National Research Council

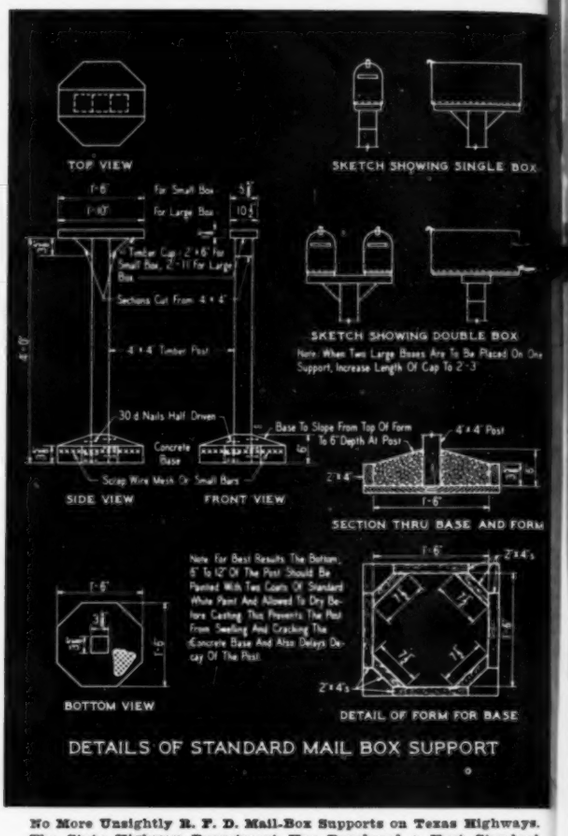
At Left, the Three National Judges and, Below, the Four Sectional Judges for the Roadside Development Awards to Be Presented by CONTRACTORS AND ENGINEERS MONTHLY to Contractors for Outstanding Contributions to Roadside Development During the 1939 Construction Season

Harris & Ewing Photo
Lacey V. Murrow, Director, Washington Department of Highways

Harris & Ewing Photo
Henry G. Shirley, Virginia State Highway Commissioner

G. H. Delano, Former Chief, Massachusetts Dept. of Public Works

Murray D. Van Wagoner, Michigan State Highway Commissioner


TOP VIEW
SKETCH SHOWING SINGLE BOX
For Small Box
For Large Box
Timber Cap - 2'-8" For Small Box, 2'-11" For Large Box
Sections Cut From 4" x 4"
4" x 4" Timber Post
SKETCH SHOWING DOUBLE BOX
Note: When Two Large Boxes Are To Be Placed On One Support, Increase Length Of Cap To 2'-3"
30 d Nails Half Driven
Concrete Base
Base To Slope From Top Of Form To 6" Depth At Post
4" x 4" Post
Scrap Wire Mesh Or Small Bars
SIDE VIEW
FRONT VIEW
SECTION THRU BASE AND FORM
Note: For Best Results The Bottom 6" To 12" Of The Post Should Be Painted With Two Coats Of Standard White Paint And Allowed To Dry Before Casting This Prevents The Post From Swelling And Cracking The Concrete Base And Also Delays Decay Of The Post
BOTTOM VIEW
DETAIL OF FORM FOR BASE
DETAILS OF STANDARD MAIL BOX SUPPORT

No More Unsightly R. F. D. Mail-Box Supports on Texas Highways. The State Highway Department Has Developed a Neat Standard Support, the Design for Which Is Shown Above. See Page 26.

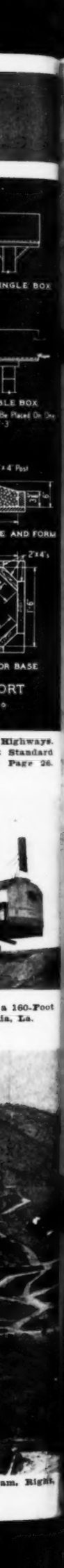
C. & E. M. Photo
Heavy Traffic at the Bus Stops at the N. Y. World's Fair Has Required Considerable Maintenance on the Roads. See Page 2.

C. & E. M. Photo
Two Arched Ribs of the 95-Foot Span of a Spandrel Arch Bridge Over Onion Creek, Near Austin, Texas. See Page 7.

C. & E. M. Photo
The B-13, a Bucyrus-Erie Steam Dragline with a 160-Foot Boom and 6-Yard Bucket Working at Vidalia, La. See Page 8.

Lawrence County, S. D., Uses this Auto Patrol with V-Flow to Clear Its Roads.

Scenes at Shasta Dam, the King Pin in the U. S. Bureau of Reclamation's Central Valley Project in California. Left, the Site of the Dam. Right, The Gigantic Task of Excavation Is Carried on at Many Levels. See Page 2.



Highways.
Standard
Page 26.

a 160-Foot
ia, La.

am. Right.